THE STREBLID BATFLIES OF VENEZUELA (DIPTERA: STREBLIDAE)

by

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ABSTRACT

This study was based on more than 36,000 Venezuelan Streblidae representing ca. 115 species and species complexes in 22 genera, taken from more than 6,800 bats of 95 species. Two new genera are proposed and 45 new species are described. The morphology is briefly discussed and terminology is revised. Collection data are given for each species, together with discussions on variability and host relationships when pertinent. Keys to genera and species are included, as well as illustrations of most species. *Noctiliostrebla dubia* (Rudow) and the male of *Parastrebla handleyi* Wenzel are characterized, and relationships of *Speiseria* are discussed. New Taxa—*Anastrebla caudiferae* n. sp., *Anastrebla spurrelli* n. sp.; *Aspidoptera falcata* n. sp.; *Exastinion deceptivum* n. sp., *Exastinion oculatum* n. sp.; *Neotrichobius bisetosus* n. sp., *Neotrichobius ectophyllae* n. sp.; *Nycterophilia mormoopsis* n. sp.; *Paradyschiria curvata* n. sp.; *Paraeuctenodes similis* n. sp.; *Phalcophila*, new genus (type species: *Phalcophila puliciformis* n. sp.); *Pseudostrebla sparsisetis* n. sp.; *Speiseria magnioculus* n. sp., *Speiseria peytoni* n. sp.; *Strebla asternalis* n. sp., *Strebla chrotopteri* n. sp., *Strebla cormurae* n. sp., *Strebla curvata* n. sp., *Strebla harderi* n. sp., *Strebla matsoni* n. sp., *Strebla obtusa* n. sp., *Strebla paramirabilis* n. sp., *Strebla proxima* n. sp.; *Trichobius affinis* n. sp., *Trichobius angulatus* n. sp., *Trichobius assimilis* n. sp., *Trichobius bilobus* n. sp., *Trichobius diaemi* n. sp., *Trichobius ethophallus* n. sp., *Trichobius flagellatus* n. sp., *Trichobius handleyi* n. sp., *Trichobius hispidus* n. sp., *Trichobius imitator* n. sp., *Trichobius jubatus* n. sp., *Trichobius leionotus* n. sp., *Trichobius longipilis* n. sp., *Trichobius parasparsus* n. sp., *Trichobius persimilis* n. sp., *Trichobius petersoni* n. sp., *Trichobius propinquus* n. sp., *Trichobius silvicolae* n. sp., *Trichobius strictisternus* n. sp., *Trichobius tiptoni* n. sp., *Trichobius tuttlei* n. sp.; *Xenotrichobius*, new genus (type species: *Xenotrichobius noctilionis* n. sp.). New Synonymy—*Aspidoptera buseckii* Coquillett, 1899, a syn of *Aspidoptera phyllostomatis* (Perty [*Lipoptena*], 1833); *Noctiliostrebla megastigma* (Speiser [*Lepopteryx*], 1900) a syn. of *Noctiliostrebla dubia* (Rudow [*Lipoptena*], 1871); *Strebla carolliae* Wenzel, 1966, a syn. of *Euctenodes guajiro* Garcia and Casal, 1965; *Euctenodes guarani* Garcia and Casal, 1965, a syn. of *Strebla mirabilis* (Waterhouse [*Euctenodes*], 1879); *Euctenodes tupi* Garcia and Casal, 1965, a syn. of *Strebla wiedemannii* Kolenati, 1856. Removed from Synonymy—*Neotrichobius stenopterus* Wenzel, 1966, a valid species, not a syn. of *Neotrichobius delicatus* (Machado-Allison [*Pterellipsis*], 1966). New Combination—*Strebla guajiro* (Garcia and Casal [*Euctenodes*], 1965).

INTRODUCTION

The geographic position and geological history of Venezuela have resulted in biotic diversity of uncommon interest and importance. The juxtaposition and interdigitation of biogeographic provinces (Tipton and Machado-Allison, 1972) make it a crucial area for resolving the status of numerous species and understanding their distribution. The persistence of old continental shield elements adds to biologists' fascination with this area.

For these reasons alone, unusual interest attaches to the collections of mammals and their parasites made by the field teams of the Smithsonian survey of Venezuelan parasites[2], but the

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[2]For an account of the organization and objectives of the survey and of the personnel and work of the field teams, see C. O. Handley, Jr., (1976) *Mammals of the Smithsonian Venezuelan Project*, elsewhere in this volume.

extraordinarily comprehensive geographic and ecological representation of these collections, and their meticulous documentation, make them of unique importance. The broad computerized data base permits investigators—not only systematists, but ecologists and epidemiologists—to focus on problems concerning the distribution and relationship of both hosts and parasites, and to explore some of the parameters governing them, in ways that are not possible with less comprehensive samples.

This paper deals chiefly with the taxonomy of the Streblidae of Venezuela and their primary host associations. Various aspects of their ecology, biogeography, and host-parasite relationships will be discussed in more detail in a later publication.

To avoid unnecessary repetition in recording data, I have omitted the names of collectors of specimens collected by the survey teams, namely Fred P. Brown, Jr., Fred L. Harder, John O. Matson, Daniel B. and Richard B. Peacock, Norman E. Peterson, and Arden L. and Merlin D. Tuttle. These teams were under the leadership of Peterson and the Tuttles.

MATERIAL STUDIED

The collections of Streblidae made by the field teams of the Smithsonian Venezuelan Project number more than 36,000 specimens from about 6,800 host bats. This is by far the largest and most comprehensive collection of Streblidae that has been made in any major geographic or political area. In addition to this rich material, I have examined a small collection made by Dr. C. O. Handley, Jr., in 1961, at Rancho Grande (Aragua); two small collections from Dr. Carlos Machado-Allison and Dr. J. Racenis, made by themselves and colleagues of the Faculdad de Ciencias, Universidad Central de Venezuela, Caracas; and miscellaneous specimens from the collections of the Field Museum, the Museum of Comparative Zoology at Harvard University, and the Smithsonian Institution.

Prior to the Smithsonian Survey, relatively few Streblidae had been recorded from Venezuela. The first was *Noctiliostrebla dubia* (described as *Lipoptena dubia* by Rudow, 1871). In later papers, Bequaert (1942) listed 11 species, Matheson (1945) described 1, Machado-Allison (1966) treated 3 (1 new), and Wenzel, Tipton, and Kiewlicz (1966) recorded 24, many of them new. Wenzel (1970) listed 60 species, but many of these records were based on the survey collection.

Two new genera and 45 new species are among the 22 genera and 115 species represented in the present collections. Only 3 known New World genera, all of them monotypic, are unrepresented. These are *Synthesiostrebla* (*amorphochili*) known only from Peru; *Eldunnia* (*breviceps*) known from Panama and Colombia; and *Joblingia* (*schmidti*) known from Panama, Costa Rica, and Guatemala. Of these, probably only *Eldunnia breviceps* occurs in Venezuela, as does its characteristic host, *Lonchophylla robusta*.

DEPOSITION OF MATERIAL

Unless otherwise indicated, the types of new species collected by the survey are deposited in U.S. National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C. Paratypes and other specimens are to be divided equally between the U.S. National Museum, the Field Museum of Natural History (FMNH), and the Institute for Tropical Zoology, Universidad Central de Venezuela, Caracas (IZUCV)[3], except that, as series permit, specimens (including paratypes) will be deposited in various other collections, including the American Museum of Natural History, New York; the Bernice P. Bishop Museum, Honolulu; the British Museum (Natural History), London; the California Academy of Sciences, San Francisco; the Canadian National Collection (CNC) at the Biosystematics Research Institute, Canada Department of Agriculture, Ottawa; Charles University (Department of Systematic Zoology), Prague; Hebrew University—Hadassah Medical School (Department of Parasitology), Jerusa-

[3]When initials of one of these institutions are given in parentheses in relation to types or specimen records, it means that those specimens (including types) are from those collections and/or deposited in them.

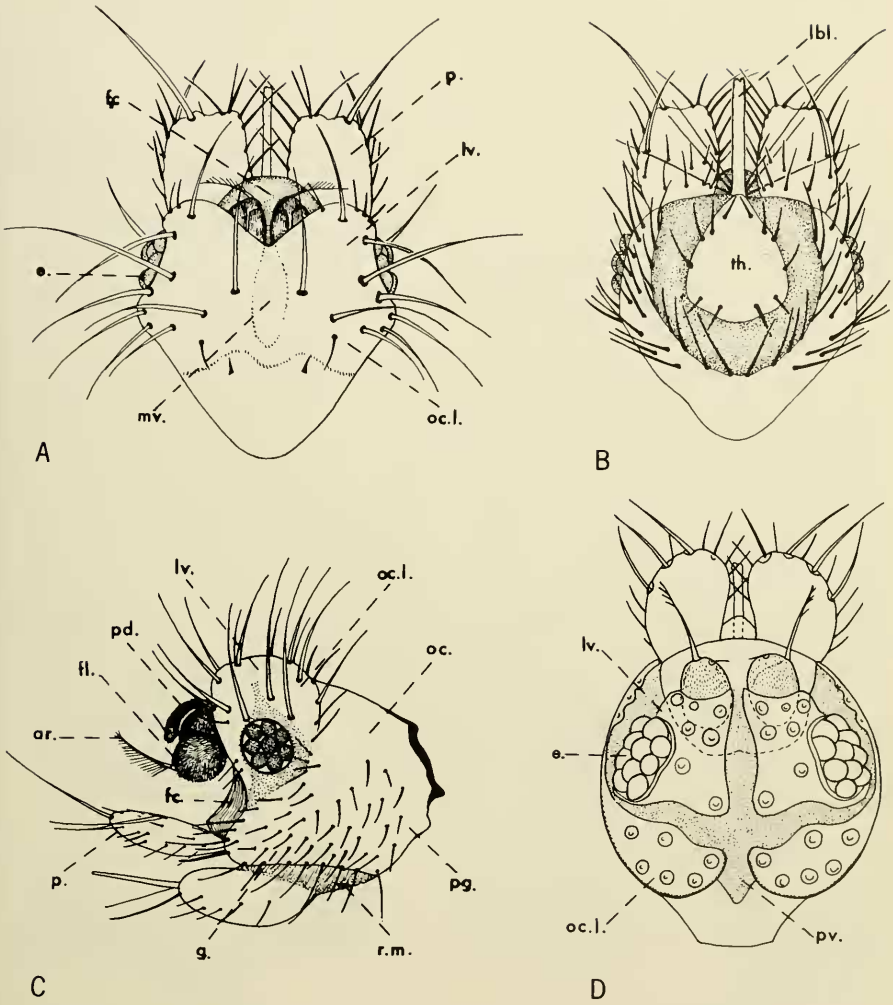

Fig. 1. Structure of head, genus *Trichobius*. A-C, *Trichobius sphaeronotus* Jobling: A, dorsal, B, ventral, and C, lateral, views of head. D, *Trichobius* sp. (*longipes* group: dorsum of head semidiagrammatic, setae omitted. A-B adapted from Zeve and Howell (1962); D adapted from Jobling (1929). See abbreviations in text.

lem; Los Angeles County Museum, Los Angeles; Museum National d'Histoire Naturelle, Paris; Museu de Zoologia, da Universidade de São Paulo; Zoologische Museum, Humboldt Universität, Berlin (Berlin Museum); Zoologisches Staatsinstitut und Zoologische Museum, Hamburg.

For type data and distribution of previously described species, see Wenzel, Tipton, and Kiewlicz (1966) and Wenzel (1970).

MORPHOLOGY AND TERMINOLOGY

To facilitate use of the descriptions and keys, the illustrations of streblid morphology and terminology that were used in *The Streblid Batflies of Panama* (Wenzel, Tipton, and Kiewlicz, 1966) are reproduced here. However, they have been altered to incorporate certain changes in terminology and interpretation that better agree with recent treatments of streblid morphology. The changes are discussed below.

Thorax. The illustrations of the thorax (Fig. 3) were adopted (Wenzel et al. 1966, Fig. 40, 41) from Zeve and Howell (1963) with somewhat changed terminology. They are somewhat inaccurate, in that they fail to show the details of the metanotum, but they do show the structures and terminology used in our taxonomic treatment. In his important paper on the thorax of Pupipara and Glossinidae, Schlein (1970, Fig. 18-20) interpreted as postnotum (*pn.*), the structure which Zeve and Howell (op. cit.) regarded as the metanotum, and as postnotal calli (*pn.c.*) the structures called tergum 3 by Zeve and Howell. I follow Schlein's interpretation. Also, I have relabeled the longitudinal and vertical membranous clefts as the notopleural suture (*np.s.*) and episternal cleft (*e.c.*), respectively, to agree with Schlein's terminology.

I have replaced the terms "sternopleura" and "pleurotrochantines" with "mesosternum" and "metasternum," respectively (= "basisternum 2" and "basisternum 3" + "furcasternum 3" of Schlein, loc. cit.), as used by Zeve and Howell (loc. cit.) and Maa (various papers).

The structure which we (Wenzel et al., 1966) called the "pleurotrochantinal lobe" is the posterior part of "furcasternum 3" of Schlein (loc. cit.). In the following descriptions, I call it the metasternal lobe (*mt.l.*). In some streblids (Fig. 4A) this ascends dorsally and even unites with epimeron 3, e.g., in the *Trichobius longipes* group, *Megastrebla parvior* Maa, and, according to Schlein (op. cit.), in some genera of Hippoboscidae.

Male Genitalia. I have also abandoned the term "gonapophyses" and substituted "postgonites," following Hennig (1971), Schlein and

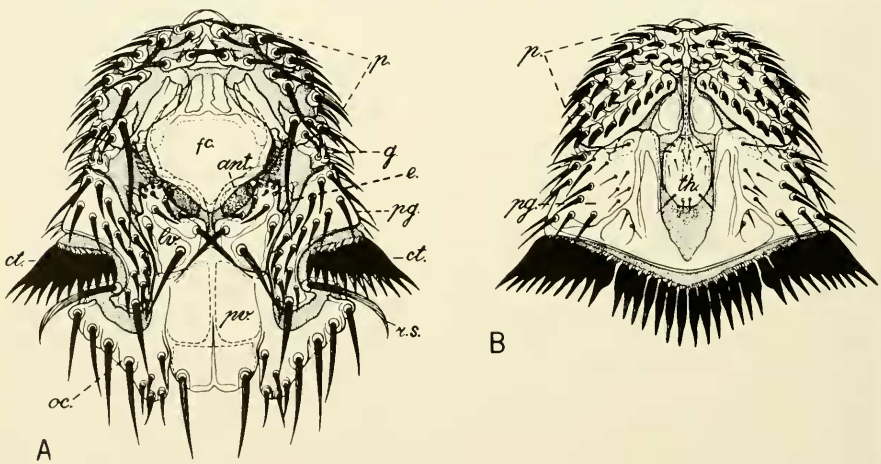

Fig. 2. Structure of head, *Metclasmus pseudopterus* Coquillett: A, dorsal, and B, ventral, views. From Jobling (1936). See abbreviations in text.

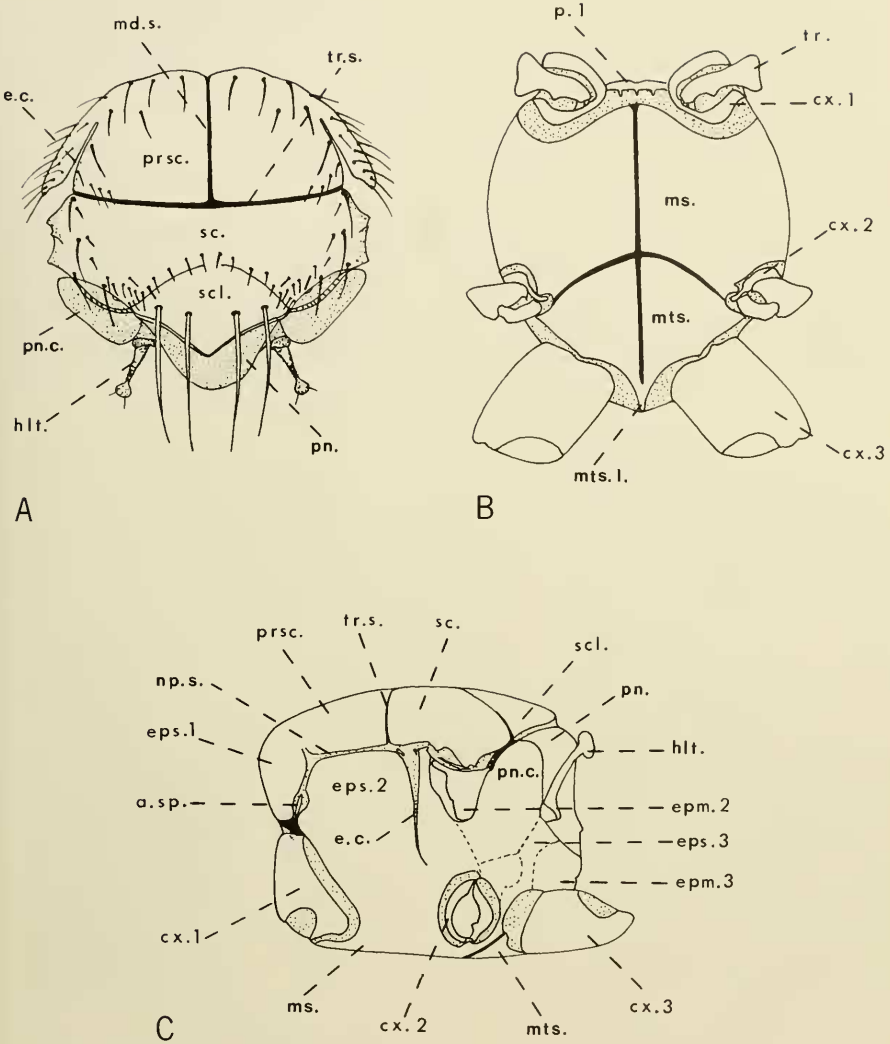

Fig. 3. Structure of thorax, semidiagrammatic, genus *Trichobius*. A, C. *Trichobius sphacronotus* Jobling: A, dorsal, and C, lateral, views. B, *Trichobius corynorhini* Cockerell: ventral view. Adapted from Zeve and Howell (1962). See abbreviations in text.

Theodor (1971), and Griffiths (1971). I have not found any structures in New World Streblidae that are comparable to the pregonites illustrated by Schlein (loc. cit., Fig. 19c, 20) for *Brachytarsina* and *Ascodipteron*. In the illustrations, the apices of the left postgonites point to the right, and vice versa.

Hennig (op. cit.) and Schlein and Theodor (1971) also interpret the "clasper shafts" of the Nycterophiliinae as extensions of tergum 9, and their distal movable digits as the surstyli (*sst.*). They further interpret as hypandrium the entire structure which Wenzel et al. (op. cit.) called gonapophyses in the Nycterophiliinae. They also stated (p. 339) that "gonites and connecting rods are absent." However, though we (Wenzel, Tipton, and Kiewlicz, op. cit.) misleadingly described this entire structure as "paired," dissection shows that it is bifid distally, and the distal paired lobes carry ventral setae similar to those of the postgonites in other New World Streblidae. Thus, the entire structure appears to be hypandrium + postgonites.

Wenzel, Tipton, and Kiewlicz (1966) referred to the extraordinarily short "setae" that may be present on many sclerites (especially) as "micropile." I believe the term "microtrichia" used by Theodor (1968) is more appropriate.

Measurements (in mm)

All measurements were made with a digital binocular compound measuring microscope.

BL = body length, measured from anterior margin of frontoclypeus in Trichobiinae and Nycterophiliinae—and from apical margin of the palpi in Streblinae—to apex of proctiger in females and apex of hypopygium in males.

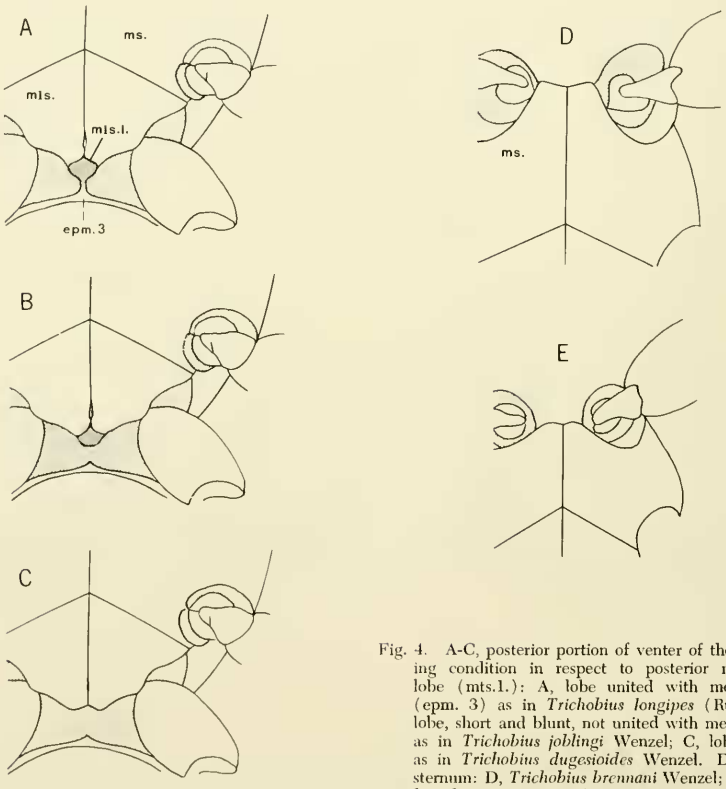

Fig. 4. A-C, posterior portion of venter of thorax showing condition in respect to posterior metasternal lobe (mts.l.): A, lobe united with metepimeron (epm. 3) as in *Trichobius longipes* (Rudow); B, lobe, short and blunt, not united with metepimeron, as in *Trichobius joblingi* Wenzel; C, lobe, absent, as in *Trichobius dugesioides* Wenzel. D-E, mesosternum: D, *Trichobius brennani* Wenzel; E, *Trichobius longipes* (Rudow).

TL = thorax length, measured from most anterior point of prescutum in Trichobiinae and Nycterophiliinae—and from middle of anterior margin in Streblinae—to apex of postnotum.

FL = femur length.

WL = wing length, measured from suture (*Ra.s.*) at base of radius (*R*) opposite humeral crossvein (*H*) to apex of wing.

WW = wing width, measured across greatest width.

List of Abbreviations

A	anal vein
aed.	aedeagus
aed.a.	aedeagal apodeme
an.	anus
ant.	antenna
ar.	arista
a.sp.	anterior thoracic spiracle
Bac.	basicosta
C	costa
ca.	calypteron?
ce.	cercus
cl.sh.	clasper shaft
conn.	abdominal connexivum
c.s.	coxal spur
ct.	ctenidium
cu	cubitus
cx.1	procoxa
cx.2	mesocoxa
cx.3	metacoxa
d.c.s.	paired dorsal connexival setae
e.	eye
e.c.	episternal cleft
epm.2	mesepimeron
epm.3	metepimeron
eps.1	proepisternum
eps.2	mesepisternum
eps.3	metepisternum
e.s.	epi-anal sclerite
fc.	frontoclypeus
fl.	flagellum
g.	gena
gon.	postgonite
H	humeral vein
hlt.	halter
hy.	hypandrium
hy.a.	hypandrial apodeme
lbl.	labella
l.l.	lateral lobe of tergum 1+2
lv.	laterovertex
M	medius
md.s.	median mesonotal suture
metn.	metanotum
m.p.l.	median pleurotrochantinal lobe
ms.	mesosternum
mts.	metasternum
mts.l.	metasternal lobe
mv.	mediovertex
np.s.	notopleural suture
oc.	occiput
oc.l.	occipital lobe
p.	palpus (maxillary)
p.l.	pronotum
pd.	pedicel
pg.	postgena
pn.	postnotum
pn.c.	postnotal callus
pr.	proctiger
prsc.	prescutum (mesoprescutum)
pv.	postvertex
R	radius
Ra.s.	suture between Sc + R and R
R.s.	radial sector
r.m.	rostral membrane
r.s.	remiform scale
sa.p.	supra-anal plate
Sc.	subcosta
sc.	scutum (mesoscutum)
scl.	scutellum (mesoscutellum)
sp.	spiracle
sst.	surstylus
st.	sternum or sternite
suba.s.	subanal sclerite
t.	tergum
t.c.	terminal cone
th.	theca
tr.	trochanter
tr.s.	transverse mesonotal suture
v.a.	ventral arc
v.a.s.	ventral accessory seta of postgonite
v.ms.	ventral macroseta of postgonite
w.p.	wing process

TAXONOMIC POSITION OF STREBLIDAE

The relationships of the Streblidae still appear to be in doubt, despite the conclusions of Hennig (1965, 1971) and Griffiths (1971). Hennig (1965) regarded the Pupipara (Hippoboscidae, Streblidae, and Nycteribiidae) as a natural group and placed them together with the Glossinidae as a family group near the Stomoxyinae in the Muscoidea. Later (1971:62 ff.), he placed them within a superfamily Glossinoidea. Griffiths (op. cit., pp. 150 ff.) treated the

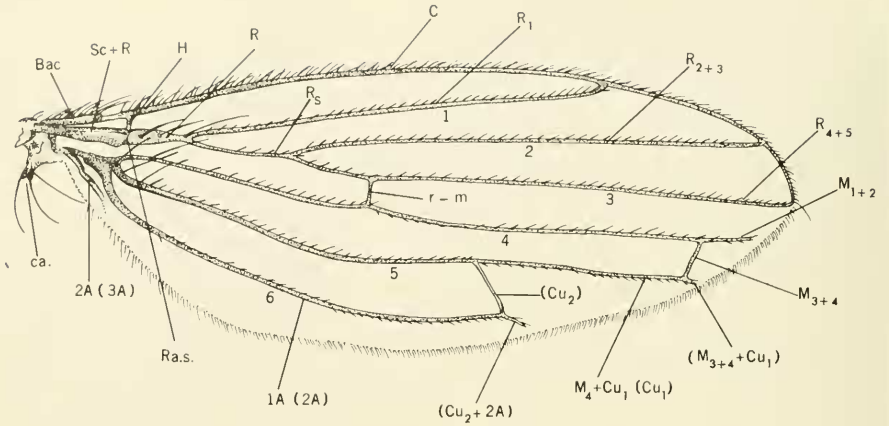

Fig. 5. Wing, *Trichobius sparsus* Kessel. Adapted from Jobling (1938). See abbreviations in text.

Pupipara and Glossinidae as a "Hippoboscidae family-group." In so doing, he reduced the Streblidae and Nycteribiidae to tribal rank within a subfamily Nycteribiidae and the Hippoboscidae to subfamily rank, all within a single family Hippoboscidae. Prefacing this treatment, and essentially quoting Hennig (1971:227), he stated that "the monophyly of the Glossinidae and Hippoboscidae, *s.l.* (or Pupipara) now seems established beyond all reasonable doubt."

Schlein (1971:369-371), on the other hand, though he agreed that the Glossinidae and Hippoboscidae are related and belong to the Calyptratae, suggested that the position of the Streblidae and Nycteribiidae should be restudied. In his opinion there is no evidence that the "conspicuous club-shaped projection on the axillary sclerite" [which Jobling (1951) interpreted as calypteron] "is homologous with the membranous calypteron of the Calyptratae." He pointed out, too, that the slit on the second segment of the antenna, regarded as "one of the main characters which defines the Calyptratae," exists also in several families of Acalypterata. In addition he noted distinctive differences in the thoracic morphology between batflies and Hippoboscidae and Glossinidae. He suggested further that similarity in genitalia between Hippoboscidae and Streblidae may be due to convergence, such as Hennig (1941) postulated between Braulidae and Nycteribiidae.

As a matter of historical interest, it should be noted that in 1941 Hennig viewed the problem differently, and Bequaert (1954) and Wenzel et al. (op. cit.) agreed with his suggestion that while Streblidae, Nycteribiidae, and Hippoboscidae may all be Calyptratae, the Hippoboscidae are not closely related to the Streblidae-Nycteribiidae. Hennig's earlier views, which they referred to and which may have been overlooked by Schlein (1971) are expressed as follows (translation from Hennig, op. cit., p. 247):

"If this [Hennig's] interpretation is to be accepted, there would be two principal groups in the Pupipara: Nycteribiidae-Streblidae and Hippoboscidae, both of which are derived from the Calyptratae, to be sure, but possibly from different roots within the group."

I am not able to critically evaluate Griffiths's (1971) extensive discussion of the male postabdomen and classification of the Cyclorrhapha. However, I do question his treatment of the Nycteribiidae and Streblidae as regards their taxonomic ranking and placement within the Hippoboscidae. He stated (op. cit., p. 150) "the further subdivision of the batfly families into Nycteribiidae and Streblidae seems unwarranted, since the differentiation of these groups can hardly have preceded the early tertiary radiation of the bats (Chiroptera); a lower rank than family seems appropriate in accordance with the time criterion of ranking." It should be noted, apart from any other considerations, that Griffiths's application of the "time criterion" is probably based on a false assumption. The Chiroptera certainly underwent considerable radiation in early tertiary, but I believe, as does

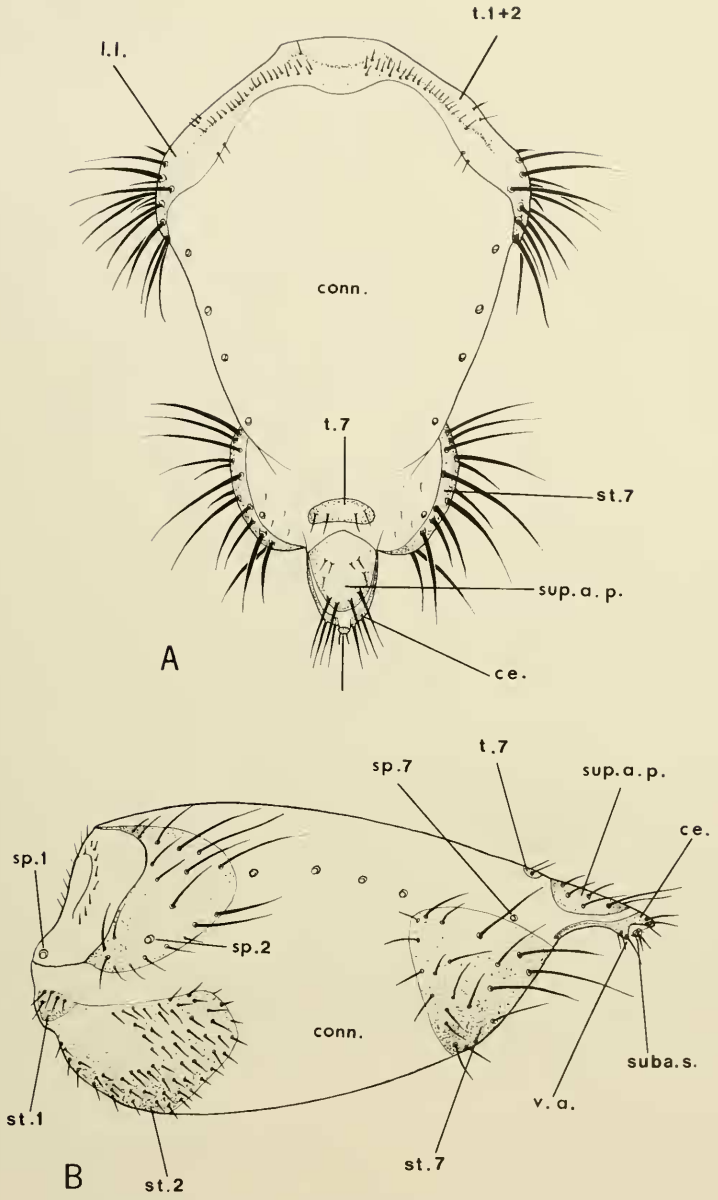

Fig. 6. Female abdomen, *Trichobius sphaeronotus* Jobling: A, dorsal, and B, lateral. views. Adapted from Zeve and Howell (1963). See abbreviations in text.

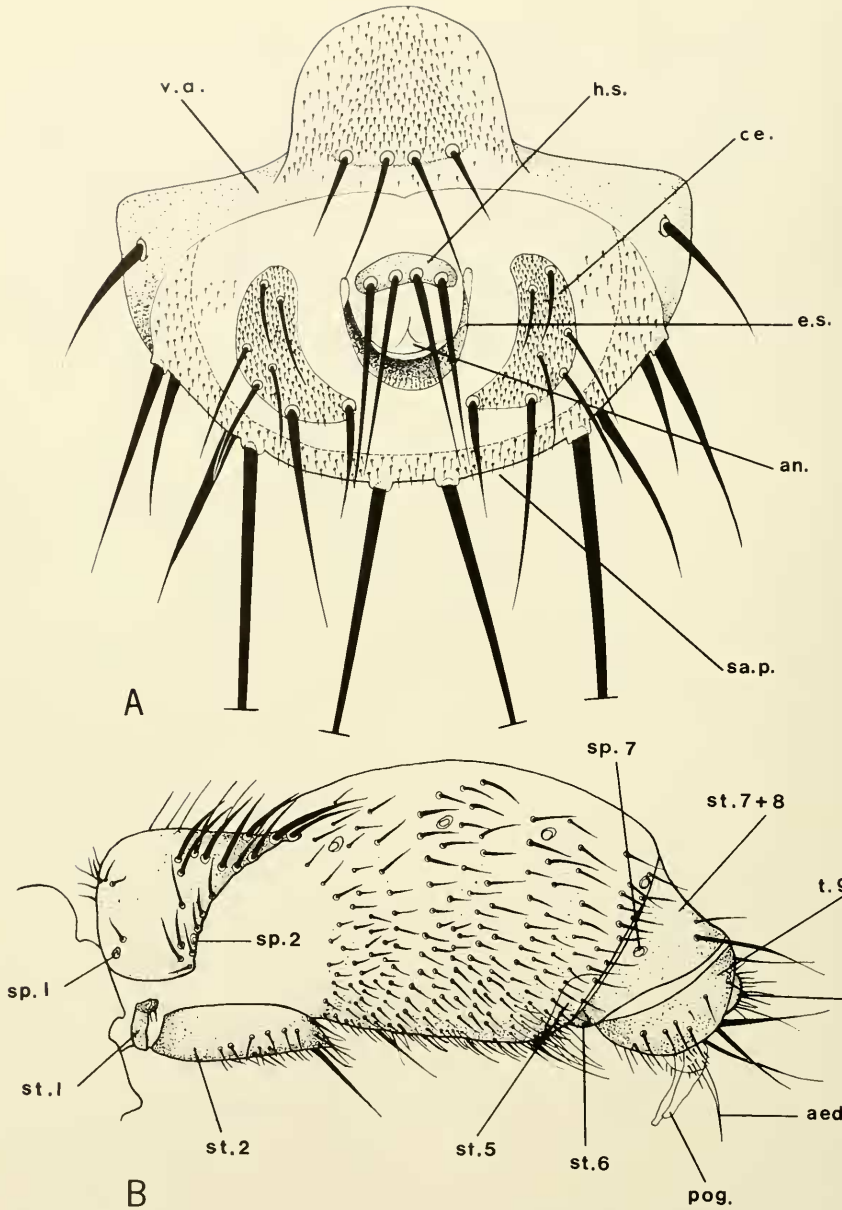

Fig. 7. A, female terminalia, ventral view: *Strebla christinae* Wenzel. B, male abdomen, lateral view, *Strebla* sp. A, from Wenzel et al. (1966); B adapted from Jobling (1951). See abbreviations in text.

Hershkovitz (pers. comm.), that continental drift best explains the present distributions of many of the higher taxa of Chiroptera. If this is so, then the Chiroptera are an ancient group whose radiation began much earlier than Griffiths believes. It should be added that the earliest known bats—from the Quercy (Eocene)—include contemporary as well as extinct taxa.

SYSTEMATICS

In the following systematic treatment, I have followed the arrangement used in Wenzel et al. (1966). In the following key, I have included the three New World genera that have not been collected in Venezuela.

For the known distribution of previously described species, see Wenzel (1970).

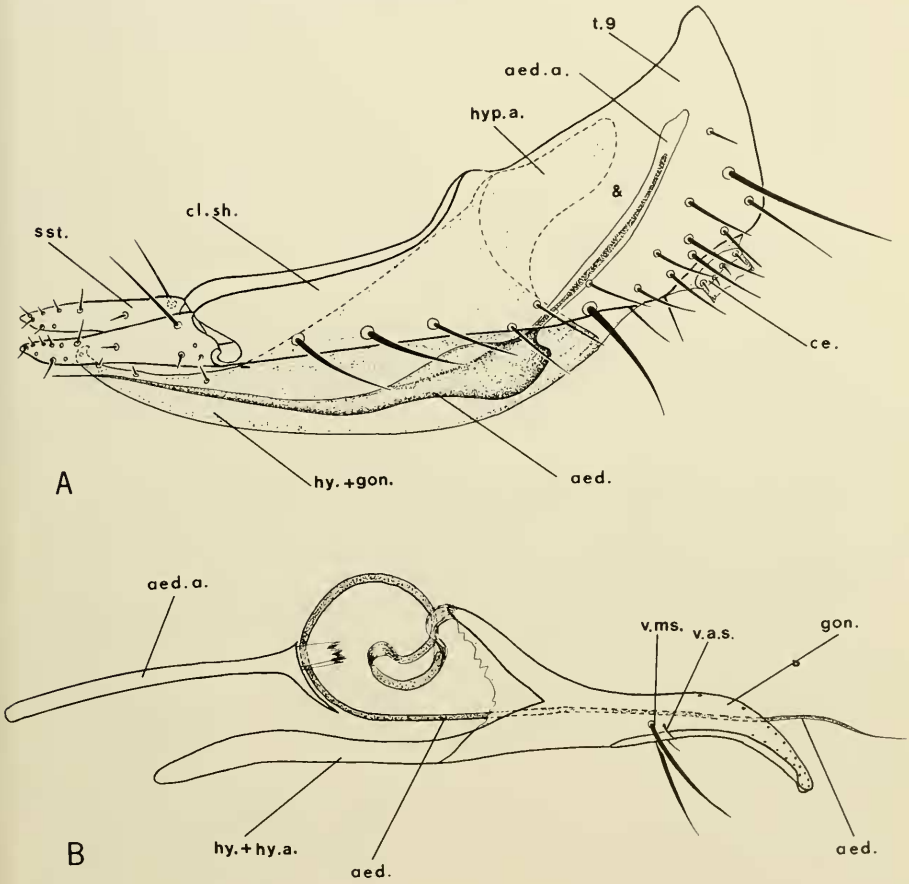

Fig. 8. Male terminalia: A, *Nycterophilia parnelli* Wenzel; B, *Strebla* sp. (U-shaped sclerites omitted). From Wenzel et al. (1966). See abbreviations in text.

Key to the Genera of New World Streblidae

1. Body strongly, laterally compressed, flealike. Wings, if fully developed, with most veins represented only by rows of setae. MALE. Preabdomen with sterna 1-6 sclerotized and distinct; genitalia (Fig. 8A) external, situated between conspicuous "claspers" (Nycterophiliinae) 2
   Body, if laterally compressed, never flealike. Wings, if fully developed, with 6 longitudinal veins (Fig. 5), sometimes reduced to oval or elongate structures, or (rarely) completely absent. MALE. Preabdomen (segments 1-6) never with sterna 3 and 4 sclerotized and distinct; 1 usually very small, sometimes reduced to a very small sclerite on each side; genitalia retracted, internal 3

2. Wings reduced to very small, apically truncate flaps. Mesonotal chaetotaxy greatly reduced, nearly absent; scutellum without setae. Hindcoxa with a large, very blunt lobe (Fig. 9B, 12A) ..... *Phalcophila* n. gen.
   Wings well developed but with reduced venation. Mesonotal chaetotaxy well developed, scutellum with 2 closely appressed macrosetae. Hindcoxa with dorsoapical spur or "nipple" (Fig. 12B-1) ..... *Nycterophilia* Ferris

3. Head with a ctenidium (Fig. 2) 4
   Head without a ctenidium (Fig. 1) (Trichobiinae) 8

4. Ctenidium consisting of only 18-19 spines, restricted to posteroventral part of head; palpi "free," with normal setae, not forming a broad shield for the front of the head ..... *Eldunnia* Curran
   Ctenidium consisting of numerous spines, extending around sides to dorsolateral parts of head; palpi very broad, covered with numerous, heavy thornlike setae, together forming a broad shield for the front of the head (Fig. 2) (Streblinae) 5

5. Wings reduced to short pads. Dorsal connexivum of abdomen covered with setae. Prescutum with a complete median suture. Postgena, behind the ctenidium, with a remiform seta (Fig. 2A *r.s.*) ..... *Metelasmus* Coquillet
   Wings normal. Dorsal connexivum of abdomen bare (but with microtrichia), except for segmentally arranged pairs of setae. Median stuture of prescutum usually short, never complete. 6

6. Hind tibiae long and slender, with numerous short setae, lacking conspicuous macrosetae on upper edge 7
   Hind tibiae with at least 2 (near apex) sometimes 6 or 8 macrosetae on upper edge, in some species as many as 12-13 setae conspicuously longer than the others, though not macrosetae ..... *Strebla* Wiedemann

7. Postgenae, behind the ctenidium, each with a laterally directed remiform scale, as in *Metelasmus*, but broader ..... *Anastrebla* Wenzel
   Postgena without a remiform scale ..... *Paraeuctenodes* Pessôa and Guimarães

8. Wings normally developed and functional 17
   Wings much reduced or absent 9

9. Wings absent.[4] Scutum membranous excepting a short sclerotized strip connecting the scutum and scutellum on each side ..... *Paradyschiria* Speiser
   Wings greatly reduced, but with recognizable venation 10

10. Venter of thorax shieldlike, anterior and posterior margins broadly rounded, the anterior margin dorsally reflexed and runnerlike. Hindlegs elongated, conspicuously longer than the others 16
    Venter of thorax not thus. Hindlegs, if elongated, not conspicuously longer than the others 11

11. Median mesonotal suture extending posteriorly beyond the transverse suture to the scutellum (Fig. 39A) 15

[4]Rarely (Wenzel, Tipton, and Kiewlicz, 1966:541) the wings of *Megistopoda aranea* may be reduced to a very minute, barely detectable flap, without veins.

Median mesonotal suture not extending posteriorly beyond the transverse suture 12

12. Median and transverse mesonotal sutures united to form an inverted Y (Fig. 44A); notopleural suture and episternal cleft closed without evidence of a suture. Lateroverticesof head each with a longitudinal pigmented suture ..... *Noctiliostrebla* Wenzel

Median and transverse mesonotal sutures, united to form an inverted T; notopleural suture and episternal cleft open (membranous) or, if closed, the line of fusion is marked by a heavily pigmented, rigid suture 13

13. Posterior margin of head rounded. Median mesonotal suture not bifurcate anteriorly; both notopleural suture and episternal cleft membranous 14

Head with 2 oblique flaplike occipital lobes, whose truncated posterior margins are festooned with setae (Fig. 43E). Median mesonotal suture bifurcate anteriorly; notopleural suture and episternal cleft closed, the rigid sutures heavy, pigmented ..... *Exastinion* Wenzel

14. Palpi slightly longer than wide, nearly vertical. Dorsum of abdomen clothed with short setae. Male. Sternum 5 absent; postgonites with accessory seta inserted proximal (anterior) to the macroseta ..... *Aspidoptera* Coquillett

Palpi oval, nearly horizontal. Dorsum of abdomen clothed with long setae. Male. Sternum 5 present, divided into 2 rounded sternites; postgonites with accessory seta inserted distal to the macroseta ..... *Anatrichobius* Wenzel

15. Minute species, body 0.73-1.29 mm long, with short legs. Wings with indistinct venation; with a (rarely, 2) distal, setigerous, digitiform process (Fig. 39C) ..... *Mastoptera* Wenzel

Large species, 3.96-5.55 mm long, with powerful, elongated legs. Wings with distinct venation, lacking a distal digitiform process ..... *Joblingia* Dybas and Wenzel

16. Inner face of profemora with a row of stout spines (Fig. 36A). Mesepisternum divided into dorsal and ventral parts by a horizontal membranous cleft similar to the notopleural suture. Wings with only 2-3 longitudinal veins (Fig. 36B) .. *Neotrichobius* Wenzel

Inner face of profemora lacking stout spines; mesepisternum not divided into two parts by a membranous cleft. Wings with 4 or more longitudinal veins (Fig. 38E) ..... *Megistopoda* Macquart

17. Middle of anterior margin of prescutum with 2 closely placed, sharp teeth which fit into grooves on the posterior part of the head; humeral calluses strong, flat projections which fit under posteroventral margin of head. Costal vein heavily sclerotized, wider and bearing strong setae from base to junction with R_1, beyond which it is narrower, less strongly sclerotized, and bears short setae; *r-m* near fork of R_s ..... *Synthesiostrebla* Townsend

Anterior margin of prescutum often sinuate, with blunt median projections, but never with a median pair of sharp teeth. Costa usually rather uniform in width and sclerotization throughout its length, *r-m* situated some distance from fork of R_s 18

18. Fifth longitudinal wing vein terminating at and united with second crossvein in an even arc which unites with fourth longitudinal vein just before wing apex. Male. A large, densely setose cone present on venter, projecting from near base of hypopygium and extending posteriorly beyond it (Fig. 30) ..... *Xenotrichobius* n. gen.

Fifth longitudinal vein continuing beyond second crossvein to or near wing apex 19

19. Upper surface of tibae, at least the pro- and mesotibiae, with macrosetae or some setae that are conspicuously longer than the others 22

Upper margins of tibiae covered with rather uniform setae, these fairly long in a few species of *Triochobius*, but without macrosetae or scattered setae that are conspicuously longer 20

20. Inner face of profemora with a diagonal row of heavy spines (represented only by strong setae in *P. lowei*). Hindlegs elongated, the tibiae (often curved) with numerous, minute, unsclerotized transverse cracks or spots ..... *Paratrichobius* Costa Lima

Inner face of profemora without strong spines, though sometimes with strong setae. Hindlegs sometimes elongated, but tibiae are straight and lack unsclerotized areas 21

21. Palpi with setae along margins only, ventral surface bare. Wing vein R_1, united with costa opposite third crossvein, both with macrosetae to this point ..... *Trichobioides* Wenzel
Ventral surface of palpi setose. Wing vein R_1 united with coastal vein at a point distinctly beyond level of third crossvein ..... *Trichobius* Gervais

22. Occipital lobes produced posteriorly as broad flaps that overlap the anterolateral margins of the prescutum, this lacking a median suture and produced anteriorly as a truncate median projection which fits between the occipital flaps; genae and postgenae evenly covered with numerous, short, posteriorly directed setae of nearly uniform size ..... *Stizostrebla* Jobling
Posterior margins of occipital lobes rounded, not flaplike; genae and postgenae with both long and short setae; anterior margin of prescutum sinuate, with a bilobed median projection, the median suture well developed, usually complete 23

23. Hindlegs greatly elongated, more than half again as long as the forelegs, the hind tibiae with uniform short setae except for 3-5 erect inconspicuous setae that are about twice as long as the others ..... *Speiseria* Kessel
Hindlegs longer than the others but not greatly elongated; hind tibiae with scattered, very long, conspicuous macrosetae in addition to the short setae 24

24. Head distinctly broader than long, nearly as broad as thorax; occipital lobes meeting in midline. FEMALE. Venter of abdomen without subapical blunt spines ..... *Pseudostrebla* Costa Lima
Head distinctly narrower than thorax; occipital lobes separated by the narrow membranous postvertex. FEMALE. Venter of abdomen with a transverse row of blunt spines anterior to the seventh sternites ..... *Parastrebla* Wenzel

Subfamily Nycterophiliinae

Key to Venezuelan Species of Nycterophiliinae

1. Eyes absent. Micropterous, wings reduced to short, apically truncate pads. Prescutal chaetotaxy reduced to a row of weak setae along each lateral margin and a few microsetae in anterolateral angles; scutellum without setae. Metatibiae with greatly reduced chaetotaxy, consisting chiefly of microsetae; inner face lacking apical "pad" of dense microsetae (as does inner face of first tarsomere); ventroapical spurlike seta absent. *Abdomen*: FEMALE. Sternum 2 very much larger than 1. MALE. Hypandrium (+ postgonites) extending only to about midlength of surstyli (*Phalcophila*) 6
Eyes a single large facet. Wings well developed, though with reduced venation. Prescutum covered with short setae. Scutellum with a pair of long, closely placed macrosetae. Metatibiae with normal chaetotaxy, including an apical pad of dense microsetae on inner face, similar dense setae on inner face of first tarsomere; ventroapical spurlike seta present. *Abdomen*: FEMALE. Sterna 1 and 2 subequal; 1, overall, a little larger than 2. MALE. Hypandrium (+ postgonites) extending to about apices of surstyli (*Nycterophilia*) 2

2. Metacoxal spur short, nipplelike (Fig. 12D, E) 3
Metacoxal spur longer (Fig. 12B, C, F-1) 4

3. Scutum and anterolateral angles of thorax densely setose; mesepisternum with 13 or 14 discal setae (Fig. 10D). FEMALE. Supra-anal terminal cone of abdomen with 4 macrosetae ..... *fairchildi* Wenzel
Scutum less densely setose, anterolateral angles sparsely setose; mesepisternum with 5-6 discal setae (Fig. 10C). FEMALE. Supra-anal cone with 2 macrosetae. ..... *parnelli* Wenzel

4. Outer face of profemur with an isolated submedian row of setae which extends for length of femur, in addition to marginal and submarginal setae ..... *mormoopsis* n. sp.

Outer face of profemur with at least 2 or 3 rows of setae (sometimes confused and/or abbreviated) in addition to the marginals and submarginals 5

5. Female. Dorsal abdominal connexivium with 5 transverse rows of segmental setae as follows: a basal row of 6, which is continuous on each side with the lateral connexival setae, and 4 median rows of 4 setae each, which are distinctly isolated from the lateral connexival setae; these are followed by 4 shorter setae of tergite 7. Ventral margins of seventh sternites each bearing a strong seta, and 1-2 shorter ones, but not spinelets. Male. Paired dorsal connexival setae on segments 3-4 very fine, short, inconspicuous ..... *coxata* Ferris

Female. Dorsal abdominal connexivum more or less uniformly covered with strong setae similar to and continuous with those along sides. Ventral margins of seventh sternites somewhat produced and bearing 3 short spinelets in addition to 1 strong, much longer seta. Male. Paired, median, dorsal connexival setae well developed, conspicuous ..... *natali* Wenzel

6. Outer apical margin of metatibiae with 4 bifid setae. Male. Marginal setae of sterna 2-7 markedly shorter than those of dorsal connexivum, resembling spinelets. Female unknown. Ex *Natalus stramineus mexicanus*, Guatemala ..... *Phalcophila* sp. A

Outer apical margin of metatibiae with 1 or 2 bifid setae. Male. Marginal setae of sterna 2-7 similar in appearance to those of dorsal connexivum; those adjacent to connexivum, at least, of nearly the same size 7

7. Outer margin of metatibiae apically with 1 apical bifid seta. Male. Surstyli about half as long as clasper shaft. Female. Sixth spiracles free, not enclosed by margin of tergum 7. Ex *Platalina genovensium*, Peru ..... *Phalcophila* sp. B

Outer margin of metatibiae apically with 2 bifid setae. Male. Surstyli long, about ⅔ length of clasper shaft. Female. Sixth spiracles enclosed by anterior margin of tergum 7. Ex *Lonchophylla robusta*, Venezuela ..... *P. puliciformis* n. sp.

Phalcophila, new genus

Type Species: *Phalcophila puliciformis*, new species

Diagnosis

With the characters of *Nycterophilia*, except as follows: *Head*. Eyes absent. *Thorax*. Prescutal chaetotaxy greatly reduced, consisting of a row of setae along each lateral margin, a few microsetae in anterolateral angles and sometimes a couple of microsetae or discs. Scutellum without setae. Mesepisternum much shorter than remainder of thorax. *Wings*. Reduced to small, apically truncate pads. *Legs*. Metatibiae with greatly reduced chaetotaxy, consisting chiefly of microsetae; ventroapical spurlike seta lacking, as is the usual elongate apical patch of microsetae on the inner face of the tibia and of the first tarsomere. *Abdomen*: Female. Tergum 7 very large, conspicuous, extending ventrally on each side about halfway to ventral margin. Sternum 2 very large, conspicuously longer than 1. Male. Hypandrium (+ postgonites) extending only to or to about midlength of surstyli rather than to apex.

Discussion

The type species, and two others which are undescribed, clearly represent a separate lineage sufficiently set apart from *Nycterophilia*, to warrant segregating them as a distinct genus.

In the key to the species of Venezuelan Nycterophiliinae, I have included two undescribed species of *Phalcophila* so as to facilitate the identification of *P. puliciformis*. Species A is represented by 3 males (FMNH) collected in Guatemala (Santa Clara, interior valley of Sierra de las Minas, ex *Natalus stramineus*) by Luis de la Torre. Species B is represented by 3 males and 2 females (MCZ) collected in Peru (Caravelí near Arequipa, ex *Platalina genovensium*) by F. W. Walker.

The large sternum 2 (relative to 1) of the females of *Phalcophila* approaches the condition found in most other Streblidae and invalidates the statement by Wenzel et al. (1966:430) that sternum 1 is larger overall than 2 in the Nycterophiliinae (in contrast to other Streblidae, in which it is much smaller).

I tentatively interpret the remarkable, large, apical, sclerotized abdominal tergal plate of the females of *Phalcophila* to be tergum 7. In *Nycterophilia* this is a small transverse median sclerite. The incorporation of the sixth spiracles into the anterior margin of this plate in *P. puliciformis* is remarkable. The female terminal cone is a well-developed sclerite and may be homo-

logous with the supra-anal plate of other Streblidae. A comparative morphological study of the streblid abdomen is clearly in order.

Phalcophila puliciformis, new species
(Fig. 9. 12A)

The following characters separate *P. puliciformis* from other undescribed species of the genus. Outer margin of metatibiae with 2 apical bifid setae. *Abdomen.* Tergum 2 with fine, long setae along posterior margin medial to the projecting posterolateral lobe. MALE. Marginal setae of sterna 2-7 similar to adjacent setae of dorsal connexivum in appearance and size, especially the more dorsal (lateral) ones, and becoming shorter but still long and relatively slender toward venter. Surstyli long, about ⅔ the length of the clasper shaft (shaftlike portion of tergum 9). FEMALE. Anterior margin of tergum 7 (?) enclosing sixth spiracles.

DESCRIPTION

Head. Eyes absent. Lateravertices each with 6 setae, two of these conspicuously longer than the others; each side of head with 2 macrosetae on occipital lobes and a diagonal row of about 4 microsetae; posterolateral margin of occiput with 7 or 8 very short setae, the lower ones more conspicuous, though the dorsal ones are somewhat longer than the rest; 3 postgenal spinelets; apical margin of head, ventral to the theca, with 2 slender setae on each side; apical projection with 2 strong spinelike setae and, posterior to these, a microseta. Palpi each with 4 strong setae along apical margin, a microseta separating the upper and lower 2, an additional microseta situted posterior to this and another near middle, well removed from dorsal margin; posterior margin with 3 microsetae; upper posterior angle with 1 macroseta.

Thorax. Prescutum without setae excepting a row of about 4 along each lateral margin (the posterior 2 conspicuously stronger), and a group of 4-5 microsetae in each anterolateral angle. Scutum with 2 medially placed setae behind the transverse suture; 1 strong seta in each anterolateral angle; just medial to this 1 short, rather weak seta; and 1 strong seta posteriorly, on each side, about ⅓ from apex. Scutellum without setae. Mesepisternal disc with 3 microsetae arranged in a vertical row dorsal and posterior to the spiracle; a group of 4 short setae ventral to the spiracle; and ventral and posterior to these is a longer, more conspicuous one. Episternal cleft very prominent, its anterior margin with about 6 setae, the 2 ventral ones clearly longer; 2 additional short setae posterior to the procoxal cavity, and dorsal and anterior to the metacoxal cavity 3 others in an oblique row; ventral to these 2 groups is a longitudinal row of about 9 very conspicuous setae extending from base to apex of mesosternum; dorsal to these is a group of 3 microsetae below the procoxal cavity; 1 long macroseta present along ventroposterior margin of the vertical membranous cleft, and dorsal to this 1 macroseta, the rest of the thorax posterior to the cleft without setae.

Wings. Reduced to 2 short flaps which do not reach beyond tergum 2 of abdomen; costa strong, 2 other veins indistinct; with about 11 setae, these rather short near base, progressively longer and stronger distally, apex with a very long macroseta; a shorter preapical seta on the next vein, and an additional short seta near midlength of wing; veins largely restricted to anterior ½ or ⅔ of wing; distal margin truncate, appearing almost as though torn off.

Forelegs. Profemora very broad, subcircular; dorsal margin with 5 conspicuous strong setae of which the most distal and the proximal ones are macrosetae; intervals with 1 or 2 short setae and 2 widely spaced setae near apex, the more proximal one a microseta, the distal one, near apex, conspicuously longer but weak; outer face with a submarginal row of about 11-12 setae which begin near midlength and extend to apex; the rest of outer face with about 20-22 short setae including about 4 ventrally near base, the dorsal ones arranged in a semicircular row of about 11; inner face of profemur with a diagonal row of 3 strong, short spinelets near middle of dorsal margin; distal to these, at about apical third, 1 very strong, much longer spinelet and 1 shorter, strong spinelet; below these a transverse row of 3 microsetae; above lower margin anterior to trochanter is a very heavy spine, distal to this an even stronger, blunt spine, and distal to this a much more slender lanceolate spinelet. Tibiae distinctly triangular, outer margin with a row of about 11 setae, the distal ones microsetae, the basal ones progressively stronger and longer, the proximal 2 rather stout; outer face with about 13-14 other setae, of which one, placed medially near base, is conspicuously stronger and longer than the rest.

Midlegs. Mesofemur with 10-11 microsetae along upper margin and several much stronger, more conspicuous setae near apex; outer face with a row of 5-7 stronger setae below upper margin and distal to these 2 strong setae; ventrally above lower margin is a row of 6 or 7 setae; below these near midlength are 2 submarginal and 2 marginal setae, 1 on each side of unsclerotized notch. Outer margin of meso-

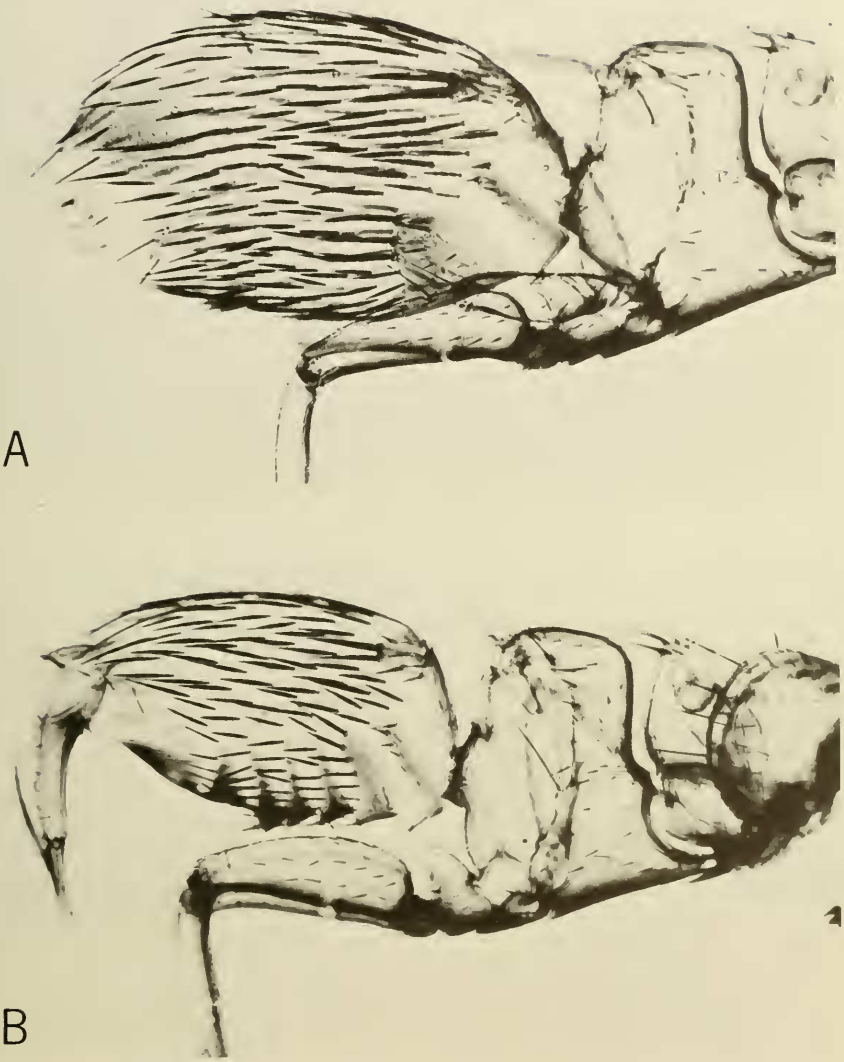

Fig. 9. *Phalcophila puliciformis*, new genus, new species, thorax and abdomen, lateral view: A, female; B, male.

tibiae with about 5 very long conspicuous setae alternating with very short ones; outer face with 18-19 bristles roughly arranged in 2 longitudinal rows; ventral margin with 7-8 very fine, short setae and a long apical seta.

Hindlegs. Metacoxa with a strong, dorsal, posteriorly projecting blunt lobe; ventrolateral half of coxa with 5-6 bristles, one of these a conspicuous spinelet; anterior to this is a microseta. Metafemora with 10-11 microsetae and 3 conspicuous long setae, two of these situated proximal to midlength and widely separated, the third situated at about apical fifth; outer face with 5-6 microsetae below dorsal margin and about 18 setae roughly arranged in 3 rows, the ventralmost row consisting of only 2 setae, the most distal seta of dorsal row long and conspicuous. Metatibiae: upper margin with about 12 microsetae (most of these so minute as to barely be detectable in slide preparations), and the characteristic pair of bifid setae near apex; outer face with a median longitudinal row of about 10-11 setae, the more proximal ones extremely minute, the distal ones becoming progressively longer, the apical seta conspicuous; ventral margin with 12-13 microsetae and, above these, 4 submarginal microsetae; apicoventral spurlike seta absent. Inner face of metatibiae with 8-9 scattered microsetae on about apical ¾.

Abdomen: FEMALE. Tergum 1 with 5 setae on each side along sclerotized portion of posterior margin, the inner ones minute, but becoming progressively much longer and stronger laterally; anterior face of sclerotized portion with 2 well-separated setae at about midlength; median membranous portion of tergum with 2 pairs of setae, the lower pair distinctly longer. Posterolateral lobes of tergum 1+2, each with 2 very coarse subequal spinelike setae; medial to these on posterior margin are 3 other long slender setae; each posterolateral lobe also with 2 setae on lateral (lower) margin and 4 distal setae. Dorsal connexivum covered with rather coarse, long, uniformly and densely placed setae, which become more slender apicad and shorter ventrad. A very large, broad, basally emarginate, weakly sclerotized tergal plate (tergum 7 ?) covers about apical fourth of abdomen; it extends about halfway down the sides, encloses spiracle 6 on each side, just within its anterior margin, and terminates apically in a broad, rounded, shelflike projection which overhangs the cone; with very sparse long setae similar to those of the connexivum except that the distal ones are very long macrosetae; middle of apex with 2 closely placed macrosetae. Terminal cone with 2 terminal macrosetae; ventral to these on each side are 1 macroseta and 1 shorter seta. Sternum 1 very short along midline, less than half as long as sternum 2, straplike dorsally, and bearing 4 setae, the apical one strongest. Sternum 2 very long and broad, posterior margin with 3 very coarse long setae near dorsal (outer) margin on each side, and about 6 others that are similar to adjoining connexival setae; disc with 10 setae on each side, 8 of these very short and fine, the 2 dorsalmost setae conspicuously coarser. Seventh sternites small, narrowly oval, enclosing the seventh spiracles within their dorsal margin, each bearing 4 setae, 2 of these conspicuous macrosetae, the third half as long, the fourth a microseta. Apical margin of sternum 6 with about 10 setae similar to adjacent connexival setae but conspicuously longer. MALE. Setae of terga 1 and 2 similar to those of female except that the 2 heavy spinelike setae of the lateral lobes are not as coarse and the outer one is distinctly more slender than the inner. Dorsal connexivum uniformly and rather densely clothed with coarse, rather uniform setae, the apical ones conspicuously longer. Sterna 1, 3, 4, and 5 narrow and straplike dorsally; sternum 2 dorsally about twice as long as the others; sternum 6 rather broadly triangular in lateral view; sternum 1 with a longitudinal row of 7 setae, the upper 3 considerably coarser and larger than the others; marginal setae of the following sterna similar to those of the connexivum but becoming slightly more slender toward midventral line, those of sternum 2 conspicuously shorter and finer toward the midline than those above; sternum 2 with 5, sterna 3-4 with 3 submarginal or discal short setae anterior to the marginals; sterna 7 and 8 with 3 slender setae in an oblique row. "Clasper" shafts (ventral processes of tergum 9) with 5 slender setae on outer edge, the proximal one longer than the others; above these is a row of 4-5 additional slender setae along posterior margin on each side of tergum 9 and anterior to these, a macroseta; surstyli very long, nearly ⅔ the length of "clasper" shaft. Hypandrium (+ postgonites) abruptly and suddenly narrowed, almost parallel-sided in profile in about distal half, extending only to about midlength of stustyli.

MEASUREMENTS

	Males	Females
BL	1.35	1.52
TL	0.32-0.33	0.32
HFL	0.45-0.47	0.44

TYPE DATA: Male holotype (USNM) ex *Lonchophylla robusta* (SVP 23391), Venezuela,

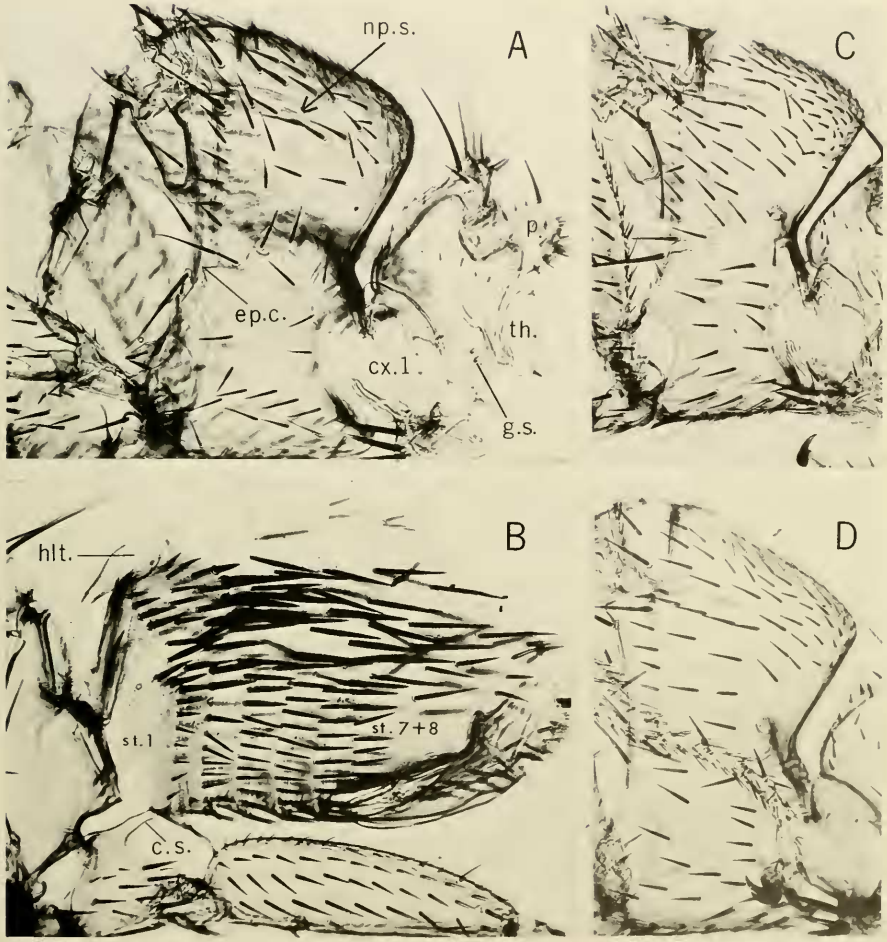

Fig. 10. A-B. *Nycterophilia natali* Wenzel: A, head and thorax, female: B, male abdomen, lateral views. C, *Nycterophilia parnelli* Wenzel: thorax, lateral view. D. *Nycterophilia fairchildi* Wenzel: thorax, lateral view. From Wenzel et al. (1966). See abbreviations in text.

Zulia, 33 km NW of La Paz, nr. Cerro Azul, 15-VI-68, N. E. Peterson and J. Matson; female allotype (USNM), same host, (SVP 34274), Barinas, Altamira, 8-I-68, A. L. Tuttle. PARATYPES—1 male paratype (IZUCV), same data as the holotype, but from *Artibeus jamaicensis*.

REMARKS

The male paratype from *A. jamaicensis* is probably a stray from specimens of *L. robusta* which were collected at the same time.

Genus *Nycterophilia* Ferris

Nycterophilia Ferris, 1916:436

TYPE SPECIES: *Nycterophilia coxata* Ferris, 1916:437

Nycterophilia coxata Ferris

(Fig. 12F-I)

Nycterophilia coxata Ferris, 1916:437, Fig. 5, Pl. 22, Fig. 6.—Hoffmann, 1953:183, 187 (part), Pl. 3, Fig. 2.—Wenzel, Tipton, and Kiewliez, 1966:434, Fig. 48B, 50B, 51A.

VENEZUELAN SURVEY RECORDS (3,493 males, 3,461 females, 246 sex undet.)

BOLÍVAR: 1 male ex 1 *Phyllostomus elongatus*, 20 km W La Paragua, Hato San José, 306 m, 4-IV-67.

CARABOBO: 1 male and 3 females ex *Pteronotus parnellii*, 6 km N Urama, Urama, 60 m, 17-III-66.

DTO. FEDERAL: 6 males and 3 females ex *Pteronotus parnellii*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 380-398 m, 20-21-VIII-66.

FALCÓN: 102 males, 85 females, and 2 sex undet. ex *Pteronotus davyi*, 49 males and 48 females ex *Pteronotus parnellii*, 45 males, 51 females, and 1 sex undet. ex 17 *Mormoops megalophylla*, 8 males, 138 females, and 27 sex undet. ex *Leptonycteris curasoae*, 3 males and 3 females ex 5 *Natalus tumidirostris*, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 10-31-VII-68; 2 males and 1 female ex *Pteronotus parnellii*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 29-30-XI-67; 8 males and 1 female, same host, 1 male and 1 female ex 1 *Sturnira lilium*, 1 male ex 1 *Chiroderma villosum*, 19 km NW Urama, Km 40, Urama, 25 m, 18-27-X-65; 1 male ex *Glossophaga longirostris*, 15 males, 17 females, and 2 sex undet. ex *Leptonycteris curasoae*, Capatárida, 40-55 m, 21-VI—14-VII-68; 2 males and 1 female ex *Glossophaga longirostris*, 504 males, 574 females, and 17 sex undet. ex *Leptonycteris curasoae*, 25 km SW Pueblo Nuevo, Yabuquiva, Península de Paraguaná, 13 m, 17-VI—20-VII-68.

GUAJIRA: 4 males and 1 female ex *Leptonycteris curasoae*, 3 males and 2 females ex 1 *Leptonycteris* Sp. B, 37 km NNE Paraguaipoa, nr. Cojoro, 15 m, 27-28-VI-68.

GUÁRICO: 29 males and 12 females ex *Pteronotus parnellii*, 10 km NE Altagracia, Hda. El Vira, 630 m, 16-IX-66.

LARA: 39 males, 21 females, and 12 sex undet. ex *Pteronotus parnellii*, 912 males, 913 females, and 169 sex undet. ex *Leptonycteris curasoae*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 518-528 m, 14-17-VII-68; 20 males, 26 females, and 14 sex undet., same host, 47 km NE El Tocuyo, La Concordia, El Tocuyo, 592 m, 23-24-VII-68.

MIRANDA: 3 males ex *Pteronotus parnellii*, 1 km E Río Chico, 1 m, 21-XI-66; 1 male, same host, 5 km NNW Guarenas, Curupao, 1,160 m, 6-X-66.

MONAGAS: 4 males and 1 female ex *Pteronotus parnellii*, 5 km NW Caripe, San Agustín, 1,165 m, 26-VI-67.

NUEVA ESPARTA: 1 male ex *Pteronotus parnellii*, 11 males and 9 females ex *Leptonycteris curasoae*, 3 km NE La Asunción, Isla Margarita, 305 m, 20-I-67; 44 males, 30 females, and 1 sex undet. ex *Pteronotus parnellii*, 86 males and 49 females ex *Leptonycteris curasoae*, 3 km S La Asunción, Isla Margarita, 53 m, 16-I—7-II-67.

SUCRE: 45 males and 36 females ex *Pteronotus parnellii*, 10 km NE Güiria, Ensenada Cauranta, 90 m, 7-VI-67; 1 male and 1 female, same host, 12 km NE Güiria, Ensenada Cauranta, 90 m, 17-VI-67; 3 males and 3 females, same host, 9 km NE Güiria, Ensenada Cauranta, 1-4 m, 3-5-VI-67; 42 males and 42 females ex *Leptonycteris curasoae*, 16 km E Cumaná, 1 m, 21-31-XII-66.

T. F. AMAZONAS: 3 males ex *Pteronotus parnellii*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-11-IV-67; 1 female ex 1 *Eumops glaucinus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 17-VII-67.

TRUJILLO: 1 female ex 1 *Artibeus jamaicensis*, 23 km N Valera, nr. Agua Viva, Valera, 164 m, 23-X-65.

YARACUY: 3 females ex *Pteronotus davyi*, 190 males and 96 females ex *Pteronotus parnellii*, 4 males and 1 female ex 4 *Pteronotus suapurensis*, 20 km NW San Felipe, Minas de Aroa, 380-400 m, 6-23-XII-67; 1 male and 1 female ex *Pteronotus parnellii*, 11 km NW Urama, El Central, Urama, 25 m, 14-III-66.

ZULIA: 117 males and 118 females ex *Lep-*

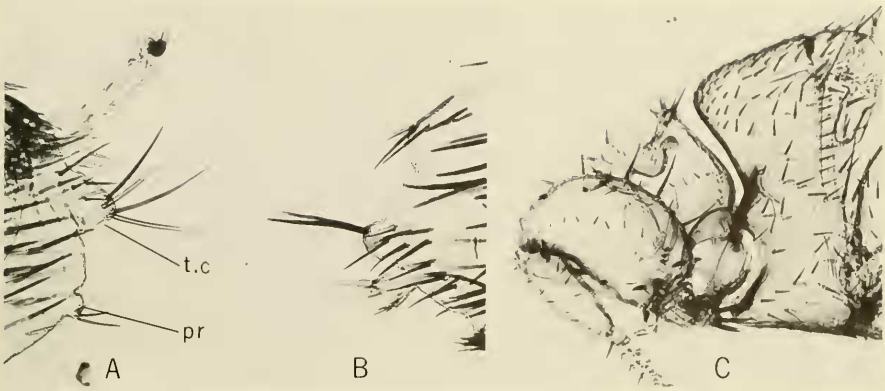

Fig. 11. A-B, apex of female abdomen, lateral views: A, *Nycterophilia fairchildi* Wenzel; B, *Nycterophilia parnelli* Wenzel; C, *Nycterophilia mormoopsis,* new species, male (Guatemala, FMNH 64995): head, thorax, and forelegs, lateral view. A-B from Wenzel et al. (1966).

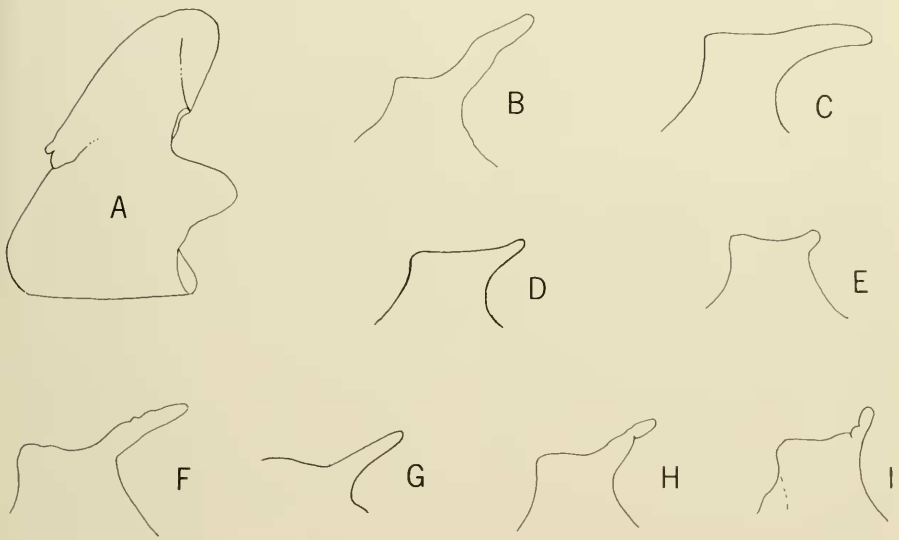

Fig. 12. Metacoxal spurs and lobes of Nycterophiliinae: A, *Phalcophila puliciformis,* new genus, new species; B, *Nycterophilia mormoopsis,* new species ex *Mormoops megalophylla* (SVP 13230); C, *Nycterophilia natali* Wenzel ex *Natalus tumidirostris* (SVP 24001); D, *Nycterophilia fairchildi* Wenzel (holotype) ex *Pteronotus suapurensis;* E, *Nycterophilia parnelli* Wenzel ex *Pteronotus parnellii* (SVI 7894); F-I, *Nycterophilia coxata* Ferris (F, ex *Macrotus mexicanus;* G, type, California; H-I ex *Leptonycteris curasoae,* Venezuela).

tonycteris curasoae, 35 km NNE Paraguaipoa, nr. Cojoro, 5-15 m, 20-VI—1-VII-68; 181 males, 168 females and 1 sex undet., same host, 36 km NNE Paraguaipoa, nr. Cojoro, 15 m, 29-VI—1-VII-68.

OTHER MATERIAL EXAMINED

COLOMBIA: 1 male and 4 females ex *Mormoops megalophylla*, Dept. Bolívar, Cartagena, 2-VI-66 and V-67, C. J. Marinkelle.

HOST ASSOCIATIONS

Of the 7200 specimens of *Nycterophilia coxata* that were collected in Venezuela by the survey teams from 475 separate host bats, 6,185 (86 percent) were from 250 *Leptonycteris curasoae*, 700 (9.7 percent) from 139 *Pteronotus parnellii*, 192 (2.6 percent) from *Pteronotus davyi* and 97 (1.3 percent) from 17 *Mormoops megalophylla*. The numbers from other hosts are insignificant. From the host distribution, it is clear that *coxata*, like other species of *Nycterophilia*, is primarily a parasite of cave bats. Although it is a facultative parasite of other hosts in Venezuela, especially *P. parnellii*, *P. davyi*, and *M. megalophylla*, its primary host in Venezuela is clearly *L. curasoae*.

Both *P. parnellii* and its characteristic parasite, *Nycterophilia parnellii*, were collected in Panama (Wenzel et al., 1966) but *N. coxata* was not, nor (significantly) were bats of the genus *Leptonycteris*. Species of *Macrotus*, the other North American host of *coxata*, do not occur in Panama either.

REMARKS

It is with some reservations that I have assigned all of the above specimens to *N. coxata*. Until now, to my knowledge, *coxata* has not been collected south of Mexico. However, the specimens from *L. curasoae* agree well with the type of *coxata* (from California ex *Macrotus californicus*) as well as with specimens taken from "*Leptonycteris nivalis*" (= *L. sanborni*) in Arizona and from *Macrotus mexicanus* in Puebla, Mexico, except that the metacoxal spur is not as strongly developed as in those specimens (Fig. 12 F-G). In some Venezuelan specimens, this spur is so weakly developed (Fig. 12I) that it approaches the condition found in *N. parnelli*. Such male specimens can be separated from *N. parnelli* by the shape of the male hypandrium + postgonites and the females by having only 2 rather than 4 macrosetae on the terminal cone.

Nycterophilia fairchildi Wenzel
(Fig. 10D, 11A, 12D)

Nycterophilia fairchildi Wenzel, 1966:436, Fig. 47B, 49B, 51B.

VENEZUELAN SURVEY RECORDS (1,049 males, 669 females, 9 sex undet.)

DTO. FEDERAL: 1 female ex *Pteronotus parnellii* nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 20-VIII-66.

FALCÓN: 930 males, 564 females, and 8 sex undet. ex *Pteronotus davyi*, 5 males and 4 females ex *Pteronotus parnellii*, 44 males and 39 females ex 14 *Mormoops megalophylla*, 45 males, 30 females, and 1 sex undet. ex 24 *Leptonycteris curasoae*, 7 males and 2 females ex 5 *Natalus tumidirostris*, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 10-31-VII-68.

LARA: 1 male ex *Pteronotus davyi*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 528 m, 14-VII-68.

SUCRE: 1 male ex *Pteronotus davyi*, 26 km ESE Carúpano, Manacal, 400 m, 16-XII-67.

YARACUY: 4 males and 12 females ex *Pteronotus davyi*, 1 male ex *Pteronotus parnellii*, 11 males and 16 females ex 15 *Pteronotus suapurensis*, 1 female ex 1 *Vampyrops helleri*, 20 km NW San Felipe, Minas de Aroa, 380-400 m, 12-23-XII-67.

OTHER VENEZUELAN RECORDS

ARAGUA: 1 female ex *Pteronotus suapurensis*, Biological Station, Rancho Grande, 30-III-60, C. O. Handley, Jr.

HOST ASSOCIATIONS

Of 1,727 specimens (154 collections) of *Nycterophilia fairchildi* collected by the survey teams, 1,520 (88 percent) were from 89 *Pteronotus davyi*, 85 (4 percent) were from 14 *Mormoops megalophylla*, 75 (4 percent) were from 24 *Leptonycteris curasoae*, 26 (1 percent) were from 15 *Pteronotus suapurensis*, 12 (0.7 percent) from 6 *Pteronotus parnellii*, and 9 (0.5 percent) from 5 *Natalus tumidirostris*. The record of a single specimen from *Vampyrops helleri* is suspect.

Pteronotus davyi, the principal host from which *N. fairchildi* was collected in Venezuela, does not occur in Panama. The type and most other paratypes from Panama were from *P. suapurensis*, *P. personatus*, and *Pteronotus* species. A series (Wenzel et al., 1966) of paratypes from Colombia (Marinkelle) were reported to be from *P. personatus*.

Nycterophilia mormoopsis, new species
(Fig. 11C, 12B)

Nycterophilia n. sp., Whitaker and Easterla, 1975:243-244.

Distinct from all other known species in possessing an isolated longitudinal row of setae

that extends along midwidth of outer face of profemora. Head with 3 postgenal spinelets. Chaetotaxy of head and thorax very similar to that of *Nycterophilia parnelli, coxata*, and *natali* and similar to *coxata* and *natali* in possessing a well-developed metacoxal spur. Female. Abdomen distinctive in the great reduction of the median chaetotaxy of the dorsal connexivum, especially of segments 4-5, each of which possesses only a single pair of weak setae, these much shorter and very inconspicuous compared to those of the lateral connexivum. In other species these are at least as long as the lateral connexival setae, if not as coarse, and generally there are several setae per segment. Terminal cone with 4 macrosetae. Male. Dorsal connexival setae of abdomen, similar to those of *coxata*, i.e., barely distinguishable. Clasper shafts slender as in *natali*.

Description

Head. Eyes 1-faceted, pigmented. Chaetotaxy including lateravertices and occipital lobes very similar to that of *N. parnelli;* sides of head with a transverse row of 5 or 6 short setae, lower half of posterolateral occipital margin with about 4, upper half with 1 or 2 very pale weak setae; 3 postgenal spinelets.

Thorax. Prescutal chaetotaxy very similar to that of *parnelli.* Scutum with 4 median discal setae arranged in 2 pairs in tandem, the anterior pair somewhat longer; anterolateral angles with 2 prominent, strong setae; posterolateral angles with 2 setae, the outer one short, the inner one long and stout, scutellum with 2 very long setae. Chaetotaxy of mesepisternum very similar to that of *parnelli,* with 6 to 8 discal setae.

Wings. As in *N. coxata.*

Legs. Upper margin of profemora with a short spinelet near base, a small, short seta distal to this, and about 5 long, strong setae alternating with short setae; outer face with a dorsal submarginal row of setae which are shorter near base and somewhat longer distally, this extending to near apex; a single isolated submedian row of about 11 rather short, slender setae extends across length of outer face; ventral margin with several short marginal setae and near base a few submarginals; chaetotaxy of inner face very similar to that of *parnelli* and *fairchildi.* Metacoxal spur long, strong, usually weakly bent. Metafemur with a row of rather short, closely placed setae along upper margin; outer face with about 3 longitudinal rows of setae, setae of the 2 ventral rows somewhat longer; a conspicuously longer seta present along ventral margin proximal to unsclerotized "notch" and another shorter one between this and proximal end; inner face without conspicuous chaetotaxy except for a short setae or two near apex. Metatibial chaetotaxy as in other species of the genus: 2 subapical bifid setae on outer margin; outer face with rather uniform setae consisting of 2 longitudinal rows and a row along dorsal and ventral margin, 1 distinctly longer subapical seta and an apical spurlike seta on ventral margin at apex; inner face with a ventral submarginal row and a couple of setae near midlength, as well as the usual elongate apical patch of dense microsetae.

Abdomen. Female. Tergum 1 with a row of 5-6 stout setae along posterior margin on each side, the inner 3 short, the outer ones progressively longer; anterior face with 2 additional setae; each lateral lobe of tergum 2 with 2 very long and a shorter stout spinelet anterior to these on apical margin, and about 7 setae; inner posterior margin of tergum 2 with 4 slender setae, 2 on each side. Dorsal connexivum bare except as follows: tergum 3 (3-6 membranous) with 2 rows of setae which are continuous with the coarse lateral connexival setae, the anterior row consisting of 4 more conspicuous setae, the posterior row consisting of 4 more medially placed, very weak, shorter, slender setae and 2 more conspicuous lateral ones on each side; terga 4 and 5 each with a median pair of weak, slender setae; tergum 6 with 4 long, conspicuous setae similar to those of sides of connexivum; tergum 7 sclerotized, small, oval, transverse, with 4 similar setae. Terminal cone with 4 macrosetae. Connexivum laterally and ventrally with numerous coarse setae, these longer and more conspicuous on dorsal half, becoming finer and somewhat shorter toward the venter and again longer and more conspicuous along the venter. Dorsal (lateral) apical lobe of sternum 1 with about 5 conspicuous setae around margin; ventral to these along lateral margin are about 4 fine setae; ventral median projection with 2 conspicuous setae. Posterior margin of sternum 2 with conspicuous strong setae, the more dorsal ones stouter. Sternum 6 with about 8-10 conspicuous stout setae along posterior margin. Sternites 7 weakly sclerotized, with 6-7 bristles along posterior margin, several conspicuously longer than the others, and several submarginal bristles, the more median ones conspicuously longer than the others. Male. Chaetotaxy of terga 1 and 2 very similar to that of female except that the pair of setae on each side of midline of posterior margin consists of 1 longer and 1 short setae. Dorsal connexivum bare except for 3 median segmental pairs of very short inconspicuous pale setae; dorsolateral setae very

long, conspicuous. Setae of sterna conspicuously longer dorsally and becoming much shorter and finer toward venter excepting those along median line which are stout and spiniform. Sternum 1 with 5 conspicuous spiniform setae along dorsal (lateral) margin of lobe and about 3 to 4 other much shorter, less conspicuous setae. Upper portion of tergum 9 with 4 conspicuous setae and distal to those an oblique row of about 3 or 4 shorter setae. Free shaft of clasper with 4 or 5 conspicuously long setae; base with about 8 other irregularly placed setae, one of these very long and conspicuous. Hypandrium (+ postgonites) nearly as long as shaft. Aedeagus ribbonlike distally.

MEASUREMENTS

	Males	Females
BL	1.15-1.19	1.00-1.50
TL	0.39-0.44	0.42-0.47
HFL	0.42-0.47	0.49-0.52

TYPE DATA: Male holotype (FMNH) ex *Mormoops megalophylla* (FMNH 64995-65015), Guatemala, Peten, Jobitzinal Cave, Santa Elena, 4 mi W Flores, 200 m, 9-XI-48, Luis de la Torre. Female allotype (FMNH), same data. PARATYPES—COLOMBIA. BOLÍVAR: 22 males and 21 females (8 lots) ex *Mormoops megalophylla*, various dates, V-VI-66—V-VI-67; 1 female ex *Molossus molossus*, V-67; 2 males ex 1 *Pteronotus suapurensis*, 2-VI-66; 1 male and 1 sex undet. ex *Pteronotus parnellii*, VI-67, Cartagena, C. J. Marinkelle.

GUATEMALA. ALTA VERA PAZ: 1 female (FMNH) ex *Mormoops megalophylla*, Cueva de Lanquin, Lanquin, 1000 ft elev, 31-V-48, Rodger D. Mitchell and Luis de la Torre; IZABAL: 1 male (FMNH) ex *Mormoops megalophylla*, Gruta Silvino, 22-VIII-69, S. and J. Peck.

MEXICO. PUEBLA: 8 males and 10 females (AMNH, FMNH) ex 5 *Mormoops megalophylla* and 1 female (AMNH) ex *Pteronotus parnellii mexicanus*, 11 km W Piaxtla, 4-I-54, R. G. Van Gelder and 1 male (AMNH) ex *Natalus stramineus mexicanus*, 20 mi E Raboso, 9-I-54, R. G. Van Gelder; SINALOA: 1 female (CNC) ex *Mormoops megalophylla*, Santa Lucia, 3200 ft elev, 28-VII-63, J. O. Smith.

VENEZUELA. FALCÓN: 42 males and 23 females ex *Mormoops megalophylla*, 1 sex undet. ex *Pteronotus davyi*, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 21-31-VII-68; SUCRE: 22 males and 21 females ex *Mormoops megalophylla*, Ensenada Cauranta, 9-11 km NE Güiria, 1-90 m, 3-7-VI-67; YARACUY: 1 female, same host, 20 km NW San Felipe, Minas de Aroa, 395 m, 11-XII-67.

HOST ASSOCIATIONS

It is evident from the data that *N. mormoopsis* is a characteristic parasite of *Mormoops megalophylla*. Some of the records from other hosts are probably contaminants, but it would be expected that this fly would occasionally be found on other hosts in cave situations.

Nycterophilia natali Wenzel
(Fig. 10A, B; 12C)

Nycterophilia natali Wenzel, 1966:438, Fig. 48A, 50A.

VENEZUELAN SURVEY RECORDS (28 males, 12 females, 2 sex undet.)

FALCÓN: 25 males, 9 females and 1 sex undet. ex *Natalus tumidirostris*, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 22-31-VII-68.

LARA: 1 male ex *Natalus tumidirostris*, 2 males, 3 females, and 1 sex undet. ex 1 *Pteronotus parnellii*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 521-528 m, 14-17-VII-68.

REMARKS

I provisionally refer these specimens to *N. natali*. The males compare well with the type of *natali*, which was taken from *Natalus stramineus mexicanus* in Panama, but I have no females from that host that I can compare with Venezuelan females from *N. tumidirostris* and they could prove to be distinct.

Nycterophilia parnelli Wenzel
(Fig. 8A, 10C, 11B, 12E)

Nycterophilia parnelli Wenzel, 1966:434, Fig. 45A, 46, 47A, 51C.

VENEZUELAN SURVEY RECORDS (122 males, 84 females)

APURE: 1 male ex *Pteronotus parnellii*, 1 female ex 1 *Lonchorhina orinocensis*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 24-28-XII-65; 1 male ex *Pteronotus parnellii*, 1 km W Pto. Páez, Cerro de Murcielagos, Pto. Páez, 76 m, 19-I-66.

BOLÍVAR: 49 males and 46 females ex *Pteronotus parnellii*, 5 km NNW Guasipati, Guasipati, 190 m, 29-IV-66; 5 males and 6 females, same host, 47 km ESE Caicara, Hato La Florida, 50 m, 19-24-IV-67; 1 male, same host, 85 km SSE El Dorado, km 125, 1,032 m, 11-V-66; 1 female, same host, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66; 11 males and 3 females,

same host, 50 km SE El Manteco, Río Supamo, 150 m, 10-IV-66.

CARABOBO: 1 male ex *Pteronotus parnellii*, 6 km N Urama, Urama, 60 m, 17-III-66; 1 male ex 1 *Lonchorhina aurita*, 3 km W Montalbán, La Leonera, Montalbán, 900 m, 22-XI-67.

FALCÓN: 1 male ex *Pteronotus parnellii*, 19 km NW Urama, Km 40, Urama, 25 m, 28-X-65.

LARA: 4 males ex *Pteronotus parnellii*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 528 m, 14-VII-68.

T. F. AMAZONAS: 2 males ex *Pteronotus parnellii*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 17-23-III-67; 5 males and 4 females, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 6-IX–2-X-67; 27 males and 18 females, same host, 1 male ex 1 *Sturnira tildae*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-11-IV-67; 3 males and 2 females ex *Pteronotus parnellii*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 12-27-VII-67; 9 males and 1 female, same host, Río Orinoco, Tamatama, 135 m, 27-IV-67.

YARACUY: 2 females ex 2 *Pteronotus davyi*. 20 km NW San Felipe, Minas de Aroa, 395 m, 21-23-XII-67.

Other Venezuelan Records

ARAGUA: 1 male ex *"Chilonycteris rubiginosa fusca"* (= *Pteronotus parnellii fuscus*), Biol. Station, Rancho Grande, 7-IX-62, J. V. Scorza, C. Machado, and M. Ramirez; 32 males and 37 females ex *"Enchisthenes hartii"* (= *Artibeus harti*) (!), same locality data, 29-VIII-62, J. V. Scorza, C. and A. J. Machado.

BOLÍVAR: 3 males and 8 females ex *"Chilonycteris rubiginosa,"* Serrania de Nuria, 31-VIII-62, J. Ojasti.

Host Associations

Of 206 specimens of *N. parnelli* that were collected by the survey teams in Venezuela, 201 (97.5 percent) were from 63 *Pteronotus parnellii*, 2 (0.9 percent) from *Pteronotus davyi* and a single specimen each from 3 non-mormoopid hosts. All specimens collected in the field in Panama were also from that host, as are almost all other specimens that I have seen. The Venezuelan record from *Enchisthenes harti* is dubious. It seems likely, from associated information, that it represents an error in labeling.

Remarks

It is very interesting (see under *N. coxata* above) that although *N. parnelli* appears to be essentially a monoxenous parasite of *P. parnellii*, nonetheless *N. coxata* (which is not) appeared to occur more abundantly and on more individual specimens of that host than did *N. parnelli*. There are other interesting facets of these relationships that will be treated later in the summarizing paper on the results of the survey.

Subfamily Trichobiinae

Genus *Trichobius* Gervais

Trichobius Gervais, 1844:14

Type Species: *Trichobius parasiticus* Gervais, 1844:14

Kolenatia Rondani 1878:169

Type Species: *Strebla wiedemanni* Kolenati, 1863 (not *Strebla wiedemanni* Kolenati, 1856)

Trichobius Townsend, 1891:105 (preocc. Gervais, 1844)

Type Species: *Trichobius dugesii* Townsend, 1891:106

Kesselia Curran, 1934:522

Type Species: *Trichobius pallida* Curran, 1934:522

Wenzel (1970) listed 34 species of *Trichobius*. In 1974, Peterson and Hurka described 10 more. The Venezuelan collections studied included 41 species of *Trichobius*, 21 of them new, bringing the total number of described species to 65. Additional undescribed species are represented in the collections of Field Museum and elsewhere.

While the genus is diverse and should probably be further divided, there is remarkable homogeneity within some groups. Many of the species are extraordinarily similar and difficult to identify without comparative collections of authoritatively identified material.

The following key reflects these difficulties. I have tried to prepare it so as to facilitate accurate identification without necessarily grouping related species.

In many instances, it is neeessary to examine both liquid preserved specimens and slide preparations. For example, the microtrichia on the mesonotum can rarely be detected using the relatively low magnifications of stereo-dissecting microscopes. One must examine cleared specimens on slides, using a compound microscope. If series are small, it may be desirable to clear the specimens with caustic or acid and preserve them in glycerin, for occasional transfer to glycerin gel or similar media on slides. In this way, the specimen is not "irrevocably" committed in a permanent mounting medium.

Perhaps the most difficult species to identify are those of the *dugesii* group, especially of the *dugesii* complex. In most of these species, the male postgonites are asymmetrical and strongly

twisted and curved to the left, making it extremely difficult to maintain a uniform orientation on slides for comparison in identifying material or for preparing illustrations. The least difference in orientation can result in a quite different appearance in shape. Thus, when these structures are very similar between species, both in shape and chaetotaxy, comparison of postgonites is almost impossible if the orientation is not almost precisely the same. Their minute size renders it impractical to preserve the postgonites separately, because they are too easily lost. In some instances, they can be extended from the abdomen and cleared, still attached, and then examined in glycerin gel or a similar medium on a slide. In the future, it may be desirable to illustrate them from several angles, using the scanning electron microscope.

It should be noted that the curving and twisting to the left of the male postgonites is most pronounced in species of the *dugesii* complex of the *dugesii* group. Only one species of this complex—*T. handleyi*—has nontwisted postgonites. In many respects, *handleyi* is closer to the species of the *parasiticus* complex, but it has a very short metasternal lobe and a very thin, threadlike sternum 6. Morphologically it can be regarded as being intermediate between species of the two complexes. In *T. dugesii, joblingi, propinquus, brevicauda,* and *macrophylli,* the postgonites are so strongly twisted that their apices are nearly at right angles to the vertical axis of the hypandrium. They are much less strongly twisted in *urodermae, assimilis, angulatus,* and *intermedius.* They are not twisted in any species of the *parasiticus* group, which, interestingly, occur chiefly on desmodontids and generalized phyllostomines (*Micronycteris* and *Lonchorhina*). The postgonites are curved to the left but not strongly so in *T. longipes,* and so slightly in *dybasi, mendezi, silvicolae,* and *affinis* as to be hardly noticeable. They are not twisted in the *caecus* and *uniformis* groups nor in the *phyllostomae* group, though in species of the latter group they are asymmetrical without the twisting.

I am not aware of asymmetrity in the postgonites of any other New World streblids.

Key to Venezuelan Species of *Trichobius*

1. Eyes a single facet 2
   Eyes multifaceted 8

2. Scutellum and a broad median area of mesonotal disc without microtrichia (these usually visible only in slide preparations). FEMALE. Postgenital sclerite as in Fig. 16K; basal portion (tergum 7) of terminal cone with 2 strong, rather closely placed setae and occasionally a third shorter seta (Fig. 16J). MALE. Hypopygium (sternum 7+8, tergum 9) with long sparse setae dorsally and apically; postgonites strongly curved (Fig. 16L) ..... *galei* Wenzel
   Scutellum and mesonotum covered with microtrichia throughout. FEMALE. Basal portion of terminal cone with at least 2 widely separated macrosetae and 2 or 3 additional, usually much shorter setae between these. MALE. Setae of hypopygium short except along apical margin 3

3. Females 4
   Males 6

4. Lateral margin of each lateral lobe of tergum 1+2 deeply emarginate, bilobed (Fig. 14C); chaetotaxy of terminal cone as in Fig. 15A ..... *bilobus* n. sp.
   Lateral lobes of tergum 1+2 not emarginate, chaetotaxy of terminal cone as in Fig. 16A, G 5

5. Chaetotaxy of lateral lobes of tergum 1+2 as in Fig. 14A. Postgenital sclerite as in Fig. 16H. ..... *johnsonae* Wenzel
   Chaetotaxy of lateral lobes of tergum 1+2 as in Fig. 14B. Postgenital sclerite as in Fig. 16B. ..... *caecus* Edwards

6. Lateral lobes of tergum 1+2 with only 6-9 setae (Fig. 14A). Postgonites as in Fig. 16I. ..... *johnsonae* Wenzel
   Lateral lobes of tergum 1+2 with 11-16 setae (Fig. 14B) 7

7. Postgonites as in Fig. 16C ..... *caecus* Edwards
   Postgonites as in Fig. 15B ..... *bilobus* n. sp.

8. Sixth longitudinal wing vein with long setae at basal angle 9
Sixth longitudinal wing vein without setae at or near basal angle 12

9. Wing vein R_1 strongly sinuate, the costal cell rather abruptly narrowed apically; R_5 markedly longer than distance between fork and crossvein *r-m*, and the latter distance no more than twice the length of *r-m*. Female. With a distinct cluster of longer discal setae in posterior angles of sternum 2. Male. Postgonites (Fig. 21D), wedge shaped in lateral view, ventral margin nearly straight, with a submarginal row of fine setae ..... *lonchophyllae* Wenzel
Wing vein R_1 straight or only very feebly sinuate, the costal cell rather evenly tapered or nearly subparallel apically; length of R_5 and distance between fork and crossvein *r-m* subequal, the latter distance more than twice the length of *r-m*. Female. Marginal setae of sternum 2 longer toward posterior angles but discal setae not longer within the angles. Male. Postgonites (Fig. 21A-C) ventrally curved and tapered, at most with 1 or 2 submarginal setae along ventral margin 10

10. Posterior margin of each occipital plate with a prominent posteriorly directed tubercle which bears a very short spineletlike seta; eyes separated by their width or more from lateral margin of head. Male. Postgonites as in Fig. 21B ..... *uniformis* Curran
Posterior margin of each occipital plate with a short seta borne on an inconspicuous tubercle, the seta not a spinelet; eyes extending to lateral margins of head or separated from margins by less than their width 11

11. Female. Four setae of tergum 7 arranged in a transverse row. Male. Postgonites as in Fig. 21A ..... *keenani* Wenzel
Female. Four setae of tergum 7 arranged one pair behind the other, the anterior and posterior pairs widely separated. Male. Postgonites as in Fig. 21C ..... *lionycteridis* Wenzel

12. Median and transverse mesonotal sutures united[5] 13
Median and transverse sutures not united 15

13. Mesonotum with a large median discal area that is essentially bare; scutum with an irregular single or double W-shaped antescutellar row of short setae 14
Mesonotum setose throughout, scutum with a row of 8-10 very long antescutellar setae, in addition to rather long discal setae which are about half the length of the antescutellars and marginals ..... *longipilis* n. sp.

14. Size larger; TL, males 0.60-0.63 mm, females 0.66-0.77 mm. Prescutum with 2 short microsetae on each side near transverse suture; W-shaped row of short antescutellar setae single. Male. Postgonites as in Fig. 19A ..... *sphaeronotus* Jobling
Size smaller; TL, males 0.47-0.52, females 0.54-0.57. Prescutum with 2 macrosetae on each side near transverse suture; W-shaped row of short antescutellar setae irregularly double. Male. Postgonites as in Fig. 19D ..... *leionotus* n. sp.

15. Eyes with 24-36 facets 16
Eyes with 7-12 facets 19

16. Occipital lobes of head with approximately 17-18 setae of varying lengths, all of them strong, a number of them as long or longer than width of lobe, those along posterior margin much shorter, the anteromedian one as long as head is wide. Mesosternum with strongly oblique sides (much as in Fig. 4E); metasternal lobe united with the metepimeron ..... *imitator* n. sp.
Occipital lobes with only 9-12 setae. Mesosternum strongly projecting between the coxae as in Fig. 4D; sides feebly oblique, nearly subparallel, anterior margin broad, subtruncate; metasternal lobe long, ascending dorsally and sometimes in contact but not actually united with metepimeron 17

17. Head of usual shape. Disc of mesonotum with dense, rather short setae; setae on scutum in front of antescutellar row distinctly larger, the antescutellar setae nearly

[5] In *longipilis* n. sp., the sutures may be feebly or not united in the males. The species is keyed out under both alternatives.

twice as long; scutellars slightly longer than width of scutellum. Anterior margin of mesosternum strongly emarginate ..... *vampyropis* Wenzel

Head (from above) broader, oblong, resembling that of *Paratrichobius* species; occipital lobes strongly transverse, rather short, each with 11-12 strong setae, 2 of them macrosetae. Mesonotal disc sparsely setose, the setae longer; scutellar setae, at least the median pair, markedly longer than width of scutellum. Anterior margin of mesosternum feebly emarginate, nearly truncate 18

18. Occipital lobes of head with ± 12 setae, including 2 conspicuously longer macrosetae. Dorsal and lateral abdominal connexivum with short setae only, excepting 1-4 stronger longer setae behind lateral lobes of tergum 2. MALE. Postgonites as in Fig. 28I ..... *petersoni* n. sp.

Occipital lobes with about 9 setae, including 2 conspicuously longer macrosetae. Dorsal abdominal connexivum with conspicuous, long, slender, semierect setae usually in segmentally arranged clusters or transverse rows of 3-5 each, sometimes of varying lengths, less numerous in males than females, and including a group of long setae behind lateral of tergum 1+2 in both sexes. MALE. Postgonites as in Fig. 28G, H ..... *hispidus* n. sp.

19. Disc of mesonotum with conspicuous bare areas, at least anteriorly on the scutum 20

Mesonotum essentially setose throughout, though median discal setae of prescutum and scutum may be much shorter and denser than the others 24

20. Prescutum with a longitudinal cluster of short setae between median and transverse sutures (Fig. 27A). Metasternal lobe well developed, extending dorsally and united with the metepimeron ..... *costalimai* Guimaraes

Prescutum without such a cluster of setae. Metasternal lobe absent 21

21. Laterovertices and occipital lobes of head not well differentiated. Scutal setae of antescutellar row long, mostly ½ to ¾ as long as scutellum, or longer 22

Laterovertices and occipital lobes well defined. Setae of antescutellar row minute 23

22. Scutum with a single row of short setae at middle immediately in front of the long antescutellars; FEMALE. Tergum 7 very small, transverse, narrower than proctiger, not united with supra-anal plate; ventral arc without conspicuous flange. MALE. Sternum 5 well developed, 6th absent. Postgonites feebly curved (Fig. 17C) ..... *sparsus* Kessel

Scutum with at least 2 rows of short setae at middle immediately in front of the antescutellars. FEMALE. Tergum 7 conspicuous, distinctly wider than proctiger, usually about twice as long as broad, usually connected with the supra-anal plate; ventral arc with conspicuous lateral, lobelike flanges. MALE. Sternum 5 absent, 6 well developed. Postgonites strongly curved, almost hooklike (Fig. 19B) ..... *parasparsus* n. sp.

23. Prescutum with very short discal setae immediately in front of the transverse suture, but rarely with more than 1 or 2 other short setae anterior to these; scutum posteriorly with an irregular W-shaped row of short setae, without scattered setae anterior to these. MALE. Postgonites as in Fig. 25A ..... *parasiticus* Gervais

Prescutum with at least several discal microsetae between the transverse row along suture and apex of median suture; scutum with scattered, sometimes numerous microsetae between the W-shaped row and the transverse mesonotal suture. MALE. Postgonites as in Fig. 26J ..... *diaemi* n. sp.

24. Occipital lobes of head densely setose, with 16-18 setae. Metasternal lobe united with metepimeron ..... *jubatus* n. sp.

Occipital lobes with 9-11 setae 25

25. Metasternal lobe absent (Fig. 4C) 45

Metasternal lobe present (Fig. 4A, B) 26

26. Metasternal lobe very short, narrow, pointed (triangular). Laterovertices and occipital lobes not "completely" differentiated. Mesonotum appearing more or less

uniformly setose; median discal setae shorter and slightly denser, but still long and conspicuous ..... *longipilis* n. sp.

Metasternal lobe often short, but broad and rounded, not pointed. Laterovertices and occipital lobes clearly differentiated. Discal mesonotal setae conspicuously short and denser than the anterolateral prescutal setae 27

27 Metasternal lobe complete, ascending and united with the metepimeron (Fig. 4A). (This can be determined accurately only by manipulation under stereo-dissecting microscope, preferably with liquid preserved specimens.) 28

Metasternal lobe not united with the metepimeron (Fig. 4B) 30

28. Anterior margin of mesosternal projection broad, obtuse and slightly notched at middle (Fig 4E) or subtruncate 28a

Anterior margin of mesosternal projection narrowly rounded as in species of the *Trichobius caecus* group ..... *strictisternus* n. sp.

28a. Size larger; TL, males 0.70-0.71 mm, females 0.78-0.82 mm. Margins of oral cavity strongly convergent posteriorly. Female. Abdominal connexivum behind lateral lobe of tergum 1+2 with a cluster of setae which are distinctly stronger than those following. Prescutal chaetotaxy distinctive in that there are very long setae near midline which are preceded by shorter setae near anterior margin. Male. Postgonites as in Fig. 28B ..... *longipes* (Rudow)

Size smaller; TL, males 0.54-0.59 mm, females 0.55-0.67 mm. Female. Abdominal connexivum without cluster of stronger setae behind lateral lobes of tergum 2. Prescutal chaetotaxy not thus 29

29. Eyes smaller, each laterovertex about half again as wide as length of eyes. Margins of oral cavity subparallel or feebly convergent then broadly rounded posteriorly. Male. Postgonites as in Fig. 28C ..... *affinis* n. sp.

Eyes (including facets) larger, width of their length only slightly less than width of each laterovertex. Margins of oral cavity strongly convergent posteriorly as in *longipes* and *mendezi*. ..... *silvicolae* n. sp.

30. Transverse mesonotal suture very strongly angulate (Fig. 24A, B) 31

Transverse mesonotal suture usually rather weakly angulate, bowed, or transverse 32

31. Underside of palpi setose on a little more than basal half. Median discal mesonotal setae relatively sparser and shorter (Fig. 24B); scutum at midline with only 2 irregular rows of minute setae between antescutellar row and transverse suture. Female. Each lateral margin of supra-anal plate with a minute seta. Male. Postgonites as in Fig. 26A ..... *assimilis* n. sp.

Underside of palpi setose on about basal half or less. Median discal setae generally denser and a little longer (Fig. 24A); scutum at midline usually with several (rarely 2) irregular rows of minute setae between antescutellar row and transverse suture. Female. Each lateral margin of supra-anal plate with a strong seta which is about ⅓ to ½ as long as distal macrosetae. Male. Postgonites as in Fig. 26B .... *angulatus* n. sp.

32. Males 33

Females 40

33. Sternum 6 absent 34

Sternum 6 present, though it may be very small and difficult to see 35

34. Eyes large, approximately as long as greatest width of each laterovertex; palpi more rounded, scarcely longer than broad. Prescutal setae very gradually longer outwardly from median discal area in front of transverse suture, those on middle half of anterior margin only about 2 - 2½ times longer than short discal setae and distinctly shorter than those in anterolateral angles. Metasternal lobe usually very short, scarcely discernable ..... *macrophylli* Wenzel

Eyes smaller, length not much more than half of basal width of each laterovertex; palpi more elongate, distinctly longer than broad. Prescutal setae rather abruptly

longer outwardly from median discal area, median setae along anterior margin about 4 times as long as shorter discal setae and of about same length as those in anterolateral angles. Metasternal lobe well developed ..... *persimilis* n. sp.

35. Prescutum covered with microtrichia in a broadly triangular area which begins near basolateral angle and widens out anteriorly so that along anterior margin it includes anterior angles and extends medially nearly to or slightly beyond the second seta inward from the median suture. Eyes very small, length equal to or slightly greater than ½ width of each laterovertex or ½ length of an occipital lobe; underside of palpi densely setose. MALE. Postgonites (Fig. 26E) symmetrical ..... *handleyi* n. sp.
Prescutum at most with microtrichia along inner margin of notopleural sutures. Palpi rather sparsely setose beneath 36

36. Eyes large, coarsely faceted, at least as long as greatest width of a laterovertex. Mesonotal chaetotaxy as in Fig. 22F. Lateral and ventral connexival setae minute, conspicuously shorter than discal setae of sternum 2. Postgonites as in Fig. 25I ..... *urodermae* Wenzel
Eyes small, with small facets, distinctly shorter than greatest width of a laterovertex. Connexival setae (except in *joblingi*) along lateral margins of abdomen of about same length as discal setae of sternum 2 37

37. Each side of sternum 7+8 with 8-10 strong setae, mostly macrosetae, and 1-2 very short dorsomedian setae. Mesonotal chaetotaxy as in Fig. 24D; setae of antescutellar row very long, mostly 5-6 times as long as the short discal setae of scutum, some extending to sockets of scutellar setae, others to apex of scutellum or beyond. Postgonites as in Fig. 26I ..... *tiptoni* n. sp
Each side of sternum 7+8 with at most 4-5 strong setae and 1 or 2 minute dorsomedian setae. Setae of antescutellar row at most 3-4 times as long as short discal setae of scutum, the median ones not extending to sockets of scutellar setae 38

38. Short setae of basal median area of prescutum (Fig. 22D) heavier, darker, and more numerous; antescutellar row of setae usually a mixture of longer and short setae, the longer ones generally 3-4 times as long as the short median discal setae of scutum. Connexival setae along lateral margins of abdomen distinctly shorter than discal setae of sternum 2. Postgonites as in Fig. 25E ..... *joblingi* Wenzel

Setae of basal median area of prescutum (Fig. 22A, B) sparser, paler and much finer, those of scutal disc, especially, often difficult to detect in liquid-preserved specimens; setae of antescutellar row usually very short, not much longer than median discal setae of scutum, though some near middle may be twice as long, and a few toward lateral ends of row may rarely be several times as long; but those near middle of row rarely extend more than half the distance to sockets of scutellar setae 39

39. Size larger, TL 0.54-0.57 mm. Prescutum with 42-47 long setae, most of those in anterior angles and along sides as long as or longer than the median suture. Postgonites as in Fig. 26G ..... *propinquus* n. sp.
Size smaller, TL no more than 0.50 mm. Prescutum with 34-36 long setae, only a few of these as long as the median suture. Postgonites as in Fig. 25G, H ..... *dugesii* Townsend

40. Lateral abdominal connexivum, posterior and sometimes slightly ventral to each lateral lobe of tergum 1+2, with a cluster of at least 3-5 (rarely 1 or 2) setae that are conspicuously coarser and longer than the others[6] 41
Lateral abdominal connexival setae rather uniform, without such conspicuously stronger and larger setae 42

41. Prescutal setae rather evenly distributed, becoming gradually longer anteriorly and laterally (Fig. 22E). Lateral abdominal connexivum with a cluster of 9-13 conspicuously stronger setae behind lateral lobes of tergum 1+2 ..... *macrophylli* Wenzel
Median prescutal setae rather abruptly denser and shorter than the longer setae later-

[6]Occasionally, females of *dugesii* have a couple of somewhat coarser setae, but these are not conspicuously coarser and stronger than the others.

ally and anteriorly (Fig. 22D). Lateral abdominal connexivum with 2-5 coarser, stronger setae (occasionally, only 1 or 2) ..... *joblingi* Wenzel

42. Prescutum with microtrichia (visible only in slide preparations) distributed in a broadly triangular area on each side, which widens anteriorly from basal angles to include second seta from median suture along anterior margin ..... *handleyi* n. sp.
Prescutum with microtrichia only in a very narrow area along margin of notopleural suture 43

43. A larger species, TL 0.66-0.71 mm. Eyes large and conspicuous, their length equal to or greater than width of each laterovertex or greatest length of occipital lobe. Thorax longer (Fig. 22F); prescutal setae very long; short scutal setae, becoming distinctly longer toward sides than at middle. Tergum 7 transverse, the two pairs of setae arranged in a transverse or irregular transverse row, not one pair behind the other, the outer pair longer. Metasternal lobe prominent, rather strongly reflexed dorsally ..... *urodermae* Wenzel
Smaller species, TL 0.51-0.60 mm. Eyes smaller, their length distinctly less than width of each laterovertex or greatest length of occipital lobe. Thorax relatively shorter, long prescutal setae shorter (Fig. 22A, C). Short scutal setae of rather uniform length, except that those of antescutellar row may be distinctly longer. Tergum 7 trapezoidal, with two pairs of setae arranged one behind the other, the anterior pair longer (one or both pairs sometimes absent) 44

44. Thorax broader; prescutum with fewer short discal setae (Fig. 22A), these often more abruptly distinct from the longer setae anterior to and lateral to them; setae of antescutellar row generally of about same length or only slightly longer than the short discal setae, sometimes (especially Venezuela specimens) about twice as long. Setae of anterior pair on tergum 7 of about same length as the lateral seta on each side of supra-anal plate. Metasternal lobe usually very short and broad ..... *dugesii* Townsend
Thorax less transverse. The short prescutal setae more numerous; setae of antescutellar row conspicuously longer than discal scutal setae anterior to them (Fig. 22C). Setae of anterior pair on tergum 7 only about one-half length of those on each side of supra-anal plate. Metasternal lobe longer, slightly reflexed ..... *persimilis* n. sp.

45. A single strong seta inserted near inner posterior angle of each laterovertex 46
One or 2 additional very short setae inserted before or behind this strong seta, or between it and margin. Male. Sternum 7+8 with 16-17 setae. Apices of postgonites strongly curved (Fig. 26F). Female. Tergum 7 very large oblong, sometimes suborbicular and with 13-17 setae, continuous with and wider than supra-anal plate, which has 4 distal macrosetae plus a row of 4 strong setae along base and a strong seta on each lateral margin ..... *ethophallus* n. sp.

46. Males 47
Females 50

47. Sternum 7+8 with 7-9 setae on each side, one very short, and one a conspicuously long macroseta, the others long, strong 48
Sternum 7+8 with ± 12 setae, mostly strong, a few short, one distinctly longer than the others. Prescutum on each side with a broad area of microtrichia, this narrower basally and widening out anteriorly to extend about two-thirds distance from lateral margin to median suture; short prescutal (and scutal) setae minute and fine as to be scarcely visible in liquid-preserved specimens (Fig. 23B) of nearly uniform size and abruptly distinct from the very long prescutal macrosetae. Apices of postgonites strongly curved (Fig. 25B) ..... *diphyllae* Wenzel

48. Tergum 9 with ca. 11-12 setae, 4 or 5 of these fairly long, the rest short. Scutal setae of antescutellar row short, only slightly longer than discals. Postgonites (Fig. 26H) beset with thornlike setae, nearly straight, apical slightly curved ..... *tuttlei* n. sp.
Tergum 9 with ± 18-20 setae, about half of them quite long, on each side 49

49. Size larger, TL 0.49-0.55 mm. Postgonites (Fig. 25D) wedge shaped, ventral margin straight, with numerous denticles. Aedeagus ribbonlike ..... *dugesioides* Wenzel
Size smaller, TL 0.44-0.51 mm. Postgonites long, slender, curved apically, with a few thornlike denticles on sides, aedeagus flagelliform (Fig. 26C, D) ..... *flagellatus* n. sp.

50. Supra-anal plate with 3 distal macrosetae ..... *tuttlei n. sp.*
Supra-anal plate with 4 distal macrosetae 51

51. Lateral connexivum immediately behind each lateral lobe of tergum 1+2 with a large patch of 10-12 or more setae that are conspicuously longer than the other minute setae of sides and venter which are quite uniform and only slightly longer distally and on venter 52
Lateral connexivum at most with a few very short but somewhat stronger setae behind lateral lobes of tergum 1+2, these followed by a large area of minute setae which suddenly become markedly longer and uniform to apex, the ventral setae shorter than these and of nearly uniform length. Tergum 7 about as wide as proctiger ..... *flagellatus* n. sp.

52. Presentum along sides, with an extensive area of microtrichia, which widens out anteriorly to extend medially near ⅔ the distance to suture; short prescutal and scutal setae minute, very fine, scarcely detectable and of nearly uniform length (Fig. 25B). Tergum 7 nearly as wide as proctiger ..... *diphyllae* Wenzel
Presentum on each side only, with a very narrow band of microtrichia along lateral margins. Shorter prescutal setae conspicuous (Fig. 25D); antescutellar setae long. Tergum 9 distinctly narrower than proctiger ..... *dugesioides* Wenzel

Trichobius pallidus group

Trichobius pallidus (Curran)

(Fig. 13A)

Kesselia pallida Curran, 1934:522

Trichobius pallidus, Wenzel, Tipton, and Kiewlicz, 1966:477, Fig. 53

VENEZUELAN SURVEY RECORDS (1 male)

T. F. AMAZONAS: 1 male ex 1 *Furipterus horrens*, Rio Orinoco, Tamatama, 135 m, 20-IV-67.

REMARKS

The single male of this very rare species that was collected by the survey was badly damaged; thus it was not possible to study the structure of the postgonites. Only the basal portion of one is preserved. It superficially appears quite different from the postgonites of *caecus* and related species, both in shape and chaetotaxy. The ventral setae are missing, but the two pairs may be subequal, judging from the size of their sockets. Unfortunately, these cannot be seen in the single type male which I have on loan from the American Museum.

The median suture of the presentum is not bifurcate in the same manner as in species of the *caecus* group, though a poorly defined, curved internal "line" extends outwardly on each side from the median suture, as in some other *Trichobius* species.

The first tarsomeres of the hindlegs bear a tuftlike seta as in species of the *caecus* group. These are also present, but reduced in the *uniformis* group. They were incorrectly described by Wenzel et al. (1966:445) as "combscales." I have not seen this type of seta in any other New World streblids. Also, as shown in Jobling's (loc. cit.) illustration, the transverse mesonotal suture of *pallidus* has two short, posteriorly directed "spurs." Specimens of *T. uniformis* sometime exhibit similar, but feebly developed, "spurs." It is possible that the *pallidus*, *caecus*, and *uniformis* groups form a natural cluster.

Trichobius pallidus appears to lack a sixth sternum in the male, while in species of the *caecus* group this is better developed than in other Trichobiinae.

Trichobius caecus group

Trichobius caecus Edwards

Trichobius caecus Edwards, 1918:424.—Wenzel, Tipton and Kiewlicz, 1966:450 Fig. 55B, 57A-C.

VENEZUELAN SURVEY RECORDS (801 males, 788 females, 2 sex undet.)

APURE: 1 male and 2 females ex *Trachops cirrhosus*, 2 males ex *Macrophyllum macrophyllum*, and 8 males and 10 females ex *Pteronotus parnellii*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 24-28-XII-65; 6 males and 4 females, same host, 1 km W Pto. Páez, Cerro de Murcielagos, Pto. Páez, 76 m, 19-I-66.

ARAGUA: 1 male ex 1 *Myotis keaysi*, 13 km NW *Maracay, Rancho Grande Biol. Sta.*, VI-III-65.

BOLÍVAR: 4 males and 4 females ex 1 *Anoura geoffroyi*, 16 males and 19 females ex *Pteronotus parnellii*, 20 km W La Paragua, Hato San José, 306 m, 10-IV-67; 2 males and 1 female ex 1 *Artibeus fuliginosus*, 1 female ex *Artibeus lituratus*, 28 males and 24 females ex *Pteronotus parnellii*, 28 km SE El Manteco, Los Patos, 150-350 m, 11-IV-66; 2 males and 3 females, same host, 56 km SE El Dorado, km 67, El Manaco, 150 m, 16-VI-66; 28 males and 11 females, same host, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-23-VI-66; 98 males and 76 females, same host, 5 km NNW Guasipati, Guasipati, 190 m, 29-IV-66; 284 males and 341 females, same host, 47 km ESE Caicara, Hato La Florida, 50 m, 19-IV—5-V-67; 1 male, same host, 21 km NE Icabarú, Icabarú, 750 m, 11-V-68; 4 males and 4 females, same host, 85 km SSE El Dorado, km 125, 882-1,032 m, 11-16-V-66; 15 males and 7 females, same host, 50 km SE El Manteco, Río Supamo, 150 m, 10-IV-66.

CARABOBO: 1 male ex *Pteronotus parnellii*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 29-XI-67; 6 males and 4 females, same host, 6 km N Urama, Urama, 60 m, 17-III-66.

DTO. FEDERAL: 6 males and 11 females ex *Pteronotus parnellii* nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 20-VIII-66; 2 males, same host, 4 km NNW Caracas, Los Venados, 1,513 m, 22-VII-65.

FALCÓN: 3 males and 2 females ex 5 *Leptonycteris curasoae*, 1 male and 2 females ex 2 *Mormoops megalophylla*, 7 males and 3 females ex *Pteronotus davyi*, 3 males and 5 females ex *Pteronotus parnellii*, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 10-31-VII-68; 1 female ex 1 *Artibeus jamaicensis*, 19 males and 11 females ex *Pteronotus parnellii*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-30-XI-67; 1 female ex 1 *Carollia perspicillata*, 24 males and 34 females ex *Pteronotus parnellii*, 1 female ex *Trachops cirrhosus*, 19 km NW Urama, Km 40, Urama, 25 m, 15-27-X-65.

GUÁRICO: 8 males and 8 females ex *Pteronotus parnellii*, 10 km NE Altagracia, Hda. El Vira, 630 m, 16-IX-66.

LARA: 8 males, 2 females, and 1 sex undet. ex *Pteronotus parnellii*, 10 km N El Tocuyo, Caserío Boro, El Tocuyo, 521-528 m, 14-17-VII-68.

MIRANDA: 1 female ex *Artibeus lituratus*, 1 km S Río Chico, 1 m, 24-X-66; 3 males and 1 female ex *Pteronotus parnellii*, 1 km E Río Chico, 1 m, 21-XI-66; 2 males, same host, 4 km SW Birongo, Cueva Walter Dupouy, Birongo, 195 m, 28-I-68; 3 males and 2 females, same host, Birongo, 60 m, 22-23-I-68; 2 males, same host, 5 km NNW Guarenas, Curupao, 1,160 m, 10-X-66; 2 males and 1 female, same host, 16 km SSE Caracas, San Andres, 950 m, 30-XII-65.

MONAGAS: 1 sex undet. ex *Desmodus rotundus*, 3 km SW Caripe, 854 m, 13-VII-67; 1 male ex 1 *Oryzomys fulvescens*, 5 km NW Caripe, San Agustín, 1,150 m, 28-VI-67.

SUCRE: 1 male and 1 female ex *Pteronotus parnellii*, 10 km NE Güiria, Ensenada Cauranta, 90 m, 7-VI-67; 2 males, same host, 9 km NE Güiria, Ensenada Cauranta, 1 m, 3-VI-67.

T. F. AMAZONAS: 2 females ex 1 *Uroderma bilobatum*, 5 males and 7 females ex *Pteronotus parnellii*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 10-I—9-II-67; 1 male ex 1 *Rhynchonycteris naso*, 68 males and 82 females ex *Pteronotus parnellii*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-11-IV-67; 1 male and 1 female ex *Desmodus rotundus*, 10 males and 9 females ex *Pteronotus parnellii*, Río Orinoco, Tamatama, 135 m, 27-IV—7-V-67; 3 males and 4 females, same host, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 3-II-67; 33 males and 39 females, same host, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 17-24-III-67; 6 males and 4 females, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 7-IX—2-X-67; 22 males and 13 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-27-VII-67.

YARACUY: 1 male ex *Pteronotus davyi*, 36 males, 23 females, and 1 sex undet. ex *Pteronotus parnellii*, 20 km NW San Felipe, Minas de Aroa, 380-400 m, 6-19-XII-67; 3 males, same host, 10 km NW Urama, El Central, Urama, 25 m, 8-III-66; 10 males and 8 females, same host, 11 km NW Urama, El Central, Urama, 25 m, 14-15-III-66.

Other Venezuelan Material Examined

ARAGUA: 6 males and 4 females ex "*Chilonycteris rubiginosa*" (= *Pteronotus parnellii*), Rancho Grande (El Limón), 30-III-60, C. O. Handley, Jr.; 8 males and 11 females ex "*Enchisthenes hartii*" (= *Artibeus hartii*), same locality except 29-VIII-62, J. V. Scorza, C. and A. J. Machado.

BOLÍVAR: 2 males and 3 females ex "*Chilonycteris rubiginosa*," Serrania de Nuria, 31-VII-62, J. Ojasti.

MIRANDA: 1 male and 3 females ex *Carollia* sp., Alfredo Jahn Cave, 7-V-61, J. Racenis, J. Ojasti, C. Bordon; 1 male and 1 female, same host and locality, 16-IV-61, C. Bordon.

HOST ASSOCIATIONS

Of 1,592 specimens of *Trichobius caecus* collected by the survey teams, 1,548 (97 percent) were from 216 *Pteronotus parnellii*, the remaining 44 specimens were from 31 individuals of 13 other hosts. Most of these other records probably represent transitory occurrences on other cave bats with which the characteristic host, *Pteronotus parnellii*, is associated. Some are probably disturbance transfers; a few are clearly contaminants (e.g., a single specimen [not recorded above] was reported from a rodent, *Oryzomys fulvescens*). The record from *Artibeus* (= *Enchisthenes*) *hartii*; is dubius.

REMARKS

I have assigned all of the above specimens to *T. caecus*. I did not find any in the collection that I could refer to *T. yunkeri*. They exhibit sufficient variation in the chaetotaxy of the female terminal cone and seventh sternites that the differences between *yunkeri* and *caecus* that were cited and illustrated by Wenzel et al. (loc. cit.) do not appear to be useful in separating these species. A detailed analysis may show statistically significant differences. The male postgonites and the female subgenital sclerite do differ (Fig. 16), but these differences could be clinal. When adequate material from Colombia becomes available, it will be interesting to see if they correlate with the distributions of the subspecies of the characteristic host, *Pteronotus parnellii*.

A "*habitus*" figure of *T. yunkeri* (Fig. 13B) is included to facilitate recognition of species of the *caecus* group.

Trichobius johnsonae Wenzel
(Fig. 14A, 16G-I)

Trichobius johnsonae Wenzel, 1966:455, Fig. 55A, 57G-I.

VENEZUELAN SURVEY RECORDS (30 males, 7 females)

BOLÍVAR: 2 females ex *Pteronotus personatus*, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66.

DTO. FEDERAL: 1 male ex *Pteronotus davyi*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 380 m, 21-VIII-66.

SUCRE: 1 male ex *Pteronotus davyi*, 26 km ESE Carúpano, Manacal, 400 m, 16-XII-67.

YARACUY: 10 males and 1 female ex *Pteronotus davyi*, 1 male ex *Pteronotus personatus*, 17 males and 3 females ex *Pteronotus suapurensis*, 20 km NW San Felipe, Minas de Aroa, 385-400 m, 7-23-XII-67; 1 female ex *Noctilio labialis*, 10 km NW Urama, El Central, Urama, 25 m, 8-III-66.

OTHER VENEZUELAN SPECIMENS EXAMINED

ARAGUA: 2 males and 3 females ex *Pteronotus suapurensis*, Rancho Grande (El Limón), 30-III-60, C. O. Handley, Jr.

HOST ASSOCIATIONS

Of 37 specimens of *T. johnsonae* collected by the survey teams, 20 (54 percent) were from 15 *Pteronotus suapurensis*, 13 (35 percent) ex 10 *P. davyi*, and 3 ex 2 *P. personatus*. The remaining record, from *Noctilio labialis*, probably represents a transitory transfer or contamination. The host associations and geographic distribution of this fly appear to parallel those of *Nycterophilia fairchildi* (q.v.).

Trichobius bilobus, new species
(Fig. 14C, 15)

A member of the *caecus* group, thus with 1-faceted eyes, bifurcate median mesonotal suture, and rather evenly setose mesonotum, the setae moderately long and slightly denser and shorter in the medial discal area of prescutum in front of the antescutellar suture; entire mesonotum covered with microtrichiae. FEMALE. Posterolateral margins of lateral lobes of tergum 1+2 emarginate, bilobed. Tergum 7 not clearly differentiated from the supra-anal plate, the two forming a rather large terminal cone; with 19 setae on basal portion, rather than 2-4 setae as usual, and 5 rather than 3 microsetae along distal margin of supra-anal plate. MALE. Postgonites similar to those of *johnsonae*, in that the ventral macroseta and accessory setae are inserted close together, but more nearly resembling those of *caecus* in general shape, and differing in being much more evenly curved (both dorsal and ventral margins).

DESCRIPTION

Virtually identical to *Trichobius johnsonae*, *caecus*, and *yunkeri* except as follows: *Abdomen*. FEMALE. Lateral lobes of tergum 1+2 (Fig. 14C), with posterolateral margin emarginate, bilobed, with 22-25 bristles, half or more of these stronger and longer than the others. Basal portion (tergum 7) of terminal cone (Fig. 15A) with 19 setae (9-10 on each side), including 6 macrosetae, 4 of these of about equal length, 2 about two-thirds the length of the others, and the rest shorter, of varying lengths; apical portion (supra-anal plate) with 5 submarginal macrosetae, the 3 median ones about half again as long as the 2 lateral ones, anterior to these (on one

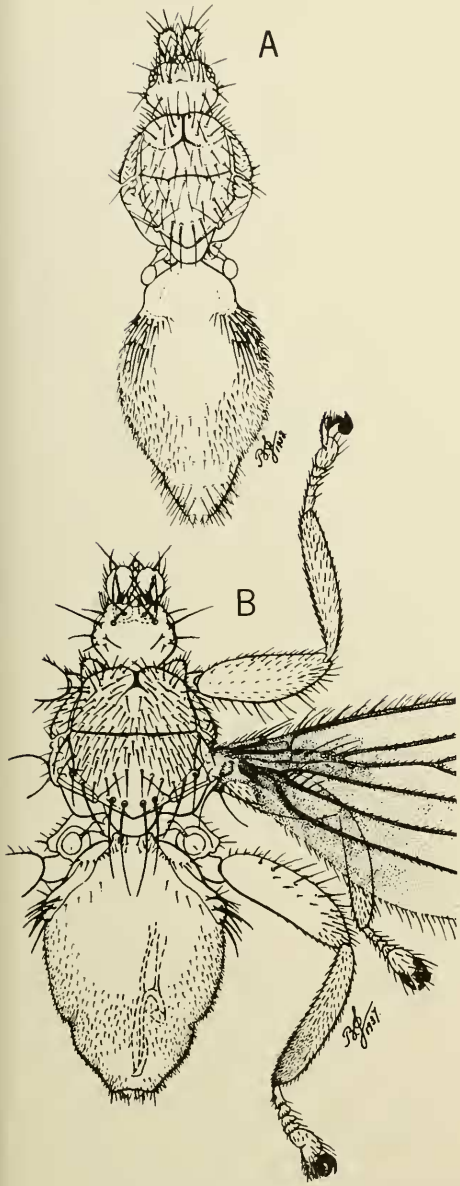

Fig. 13. A, *Trichobius pallidus* Curran, male: dorsal view. B, *Trichobius yunkeri* Wenzel, male: dorsal view. From Jobling (1938; B, as *Trichobius caecus* Edwards).

Fig. 14. Lateral lobes of tergum 1+2: A. *Trichobius johnsonae* Wenzel; B. *Trichobius caecus* Edwards; C, *Trichobius bilobus*, new species, female. A-B from Wenzel et al. (1966).

Fig. 15. *Trichobius bilobus*, new species: A, apex of abdomen, female holotype; B, left postgonite, male allotype.

side only in the type) a single large seta about half the length of the macrosetae. Seventh sternites with 8 longer bristles near apical margin, 2 of these macrosetae that are as long as each sternite is wide, 3 that are half as long or slightly longer, and 3 mesal, much shorter setae, these less than half as long as the longest macrosetae; anterior to these is a series of much shorter setae, the rest of the surface with numerous microsetae. MALE. Postgonites rather stout, both dorsal and ventral margins broadly, evenly arcuate; sides with 2 microsetae, ventral margin and apex with numerous sensillae; ventral macroseta very long, extending to near apex, accessory seta inserted very close to macroseta.

MEASUREMENTS

	Males	Females
BL	1.67	2.44
TL	0.54-0.56	0.74
WL	1.36-1.65	1.85
WW	0.67-0.80	0.79

TYPE DATA: Female holotype and male allotype (USNM), 1 male paratype (IZUCV) ex *Pteronotus suapurensis* (SVP 2881), Venezuela, Trujillo, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 14-IX-65.

OTHER VENEZUELAN MATERIAL EXAMINED

YARACUY: 1 female ex *Pteronotus suapurensis*, 20 km NW San Felipe, Minas de Aroa, 395 m, 16-XII-67 (specimen destroyed during preparation).

REMARKS

The illustration of the side view of the lateral lobes of tergum 2 is reconstructed from preliminary sketches and cannot be regarded as entirely accurate, but it does show the emargination and the general chaetotaxy. The alcohol-preserved female noted above had been set aside for illustration in glycerin because the side view could not be made from the other specimens, which were mounted in balsam in the conventional manner. Unfortunately, this specimen was inadvertently destroyed during treatment in caustic. Thus, it was impossible to draw the female "subgenital plate" either, though in the holotype female (on slide) it appears broad as in *yunkeri* and *caecus* and in no way resembles that of *johnsonae*.

Trichobius galei Wenzel
(Fig. 16J-L)

Trichobius galei Wenzel, 1966:449, Fig. 54, 57J-L
Trichobius caecus, authors (part), not Edwards

VENEZUELAN SURVEY RECORDS (179 males, 95 females, 3 sex undet.)

BOLÍVAR: 17 males, 12 females, and 1 sex undet. ex *Natalus tumidirostris*, 47 km ESE Caicara, Hato La Florida, 50 m, 19-24-IV-67.

FALCÓN: 1 male ex 1 *Leptonycteris curasoae*, 3 males ex *Pteronotus davyi*, 18 males and 7 females ex *Natalus tumidirostris*, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 22-31-VII-68; 1 male and 2 females, same host, 11 km ENE Mirimire, nr. La Pastora, 250 m, 21-XI-67.

LARA: 6 males and 7 females ex *Natalus tumidirostris*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 521 m, 17-VII-68.

MIRANDA: 37 males, 27 females, and 2 sex undet. ex *Natalus tumidirostris*, 15 km SE Caracas, Cueva Ricardo Zuloaga, El Encantado, 548 m, 14-I-68; 96 males and 40 females, same host, 15 km SE Caracas, Cueva Ricardo Zuloaga, nr. El Encantado, 548 m, 9-I-66.

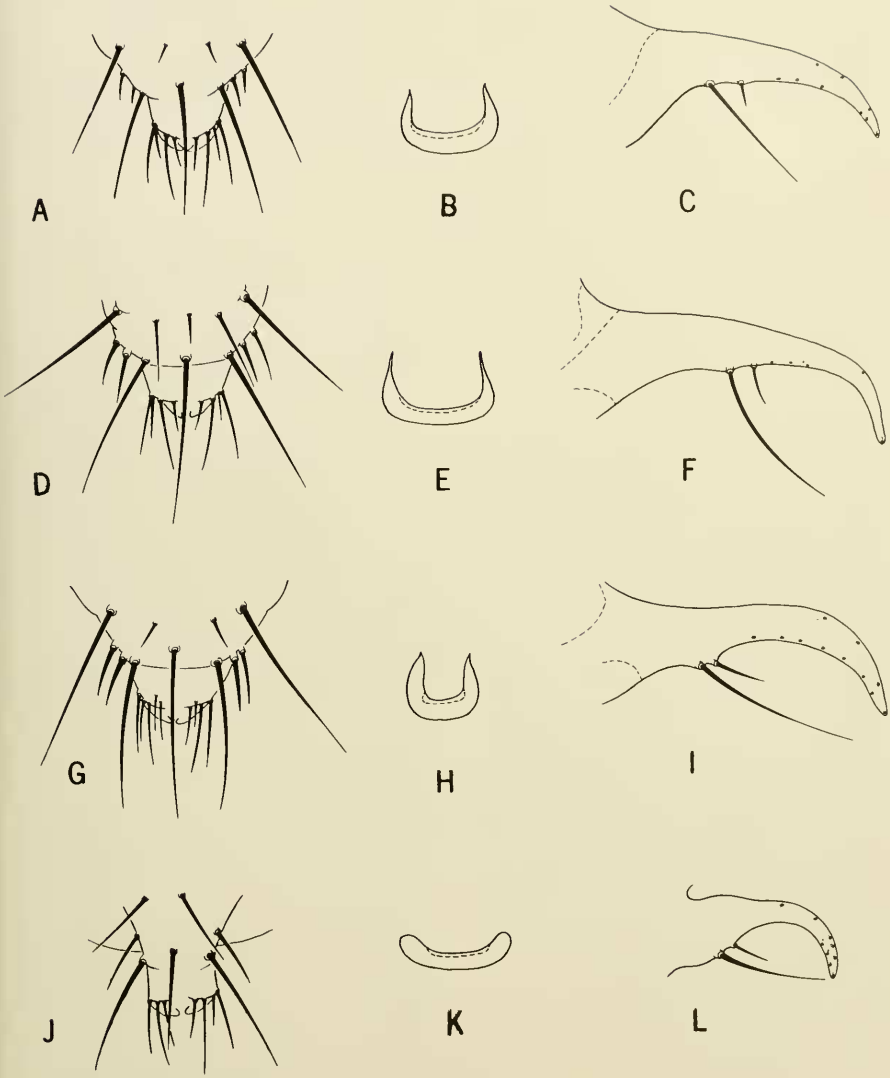

Fig. 16. Terminalia, *Trichobius caccus* group, including (from left to right) female terminal cone, female postgenital sclerite, and lateral view of male left postgonite: A-C, *Trichobius caccus* Edwards; D-F, *Trichobius yunkeri* Wenzel; G-I. *Trichobius johnsonae* Wenzel; J-L, *Trichobius galei* Wenzel. From Wenzel et al. (1966).

OTHER VENEZUELAN SPECIMENS EXAMINED

ARAGUA: 2 males ex *Natalus tumidirostris*, Rancho Grande, 17-19-VIII-49, J. Racenis.

MIRANDA: 137 males and 78 females ex *Natalus tumidirostris*, nr. Encantado, Cueva Ricardo Zuloaga, 29-IV-62, C. Bordon.

MEASUREMENTS

	Males	Females
BL	1.15	1.53-1.56
TL	0.40-0.41	0.48-0.52
WL	1.06-1.14	1.31-1.41
WW	0.51-0.54	0.60-0.63

HOST ASSOCIATIONS

Of 277 specimens of *T. galei* collected by the survey teams, 273 (98.5 percent) were taken from 73 *Natalus tumidirostris*. The remaining 4 specimens were from 2 *Pteronotus davyi* and 1 *Leptonycteris curasoae*, both cave bats like the principal host.

REMARKS

Specimens of *T. galei* collected from *Natalus tumidirostris* at the Miranda locality show distinctive differences in the number of setae on the scutum, compared with those from Panama and Colombia. For example, typical *galei* from *Natalus stramineus mexicanus* in Panama have only two rows of smaller setae (plus the antescutellars) at midline in front of the scutellum, and counts of scutal setae, including the macrosetae along lateral margins, ranged from 42-48 in the males and 41-47 in the females. In the Miranda population, on the other hand, there are usually three confused rows of setae at midline, plus the antescutellars, and counts of scutal setae range from 56-61 in males and 61-69 in females. The allopatry and alloxeny between Panamanian and Miranda populations, if considered by themselves, suggest that two distinct species are represented. However, the specimens from Falcón (Cueva del Guano), from *N. tumidirostris*, more nearly resemble *galei* in possessing only two rows of scutal setae along midline in front of the antescutellars, and, in the few slide specimens for which counts were made, the total number of setae range between 48-51 in the males. In view of this, and because these populations show no differences in the female subgenital sclerite and the male postgonites, I tentatively regard them as a single species which exhibits geographic differences in number of scutal setae.

Trichobius major group

I believe the diagnosis (Wenzel et al. 1966, p. 457) of the *Trichobius major* group should be broadened to include a number of species in which sternum 6 is present in the males, e.g., *T. longipilis* n. sp., *T. leionotus* n. sp., *T. parasparsus* n. sp., *T. robynae* Peterson and Hurka, and *T. cernyi* Peterson and Hurka.

In *T. longipilis* n. sp., the laterovertices and occipital lobes are better defined than in other members of the group, but the structure of the metasternal lobe, of male sternum 5, and of the postgonites indicate that it is best placed in this group.

Trichobius sparsus Kessel

(Fig. 5, 17)

Trichobius sparsus Kessel, 1925:17, Pl. 1, Fig. 7; Pl. 2, Fig. 10—Wenzel, Tipton, and Kiewlicz, 1966:457, Fig. 42, 58.

VENEZUELAN SURVEY RECORDS (53 males, 59 females)

BOLÍVAR: 1 male ex 1 *Natalus tumidirostris*, 13 males and 11 females ex *Pteronotus parnellii*, 47 km ESE Caicara, Hato La Florida, 50 m, 19-24-IV-67; 2 males and 3 females, same host, 56 km SE El Dorado, km 67, El Manaco, 150 m, 16-VI-66; 6 males and 3 females, same host, 59 km SE El Dorado, km 74, El Manaco, 150 m, 13-23-VI-66; 2 males and 1 female, same host, 5 km NNW Guasipati, Guasipati, 190 m, 29-IV-66; 8 males and 8 females, same host, 20 km W La Paragua, Hato San José, 306 m, 10-IV-67; 1 male, same host, 85 km SSE El Dorado, Km 125, 1,032 m, 11-V-66; 6 males and 12 females, same host, 28 km SE El Manteco, Los Patos, 150-350 m, 11-IV-66; 2 males and 4 females, same host, 50 km SE El Manteco, Río Supamo, 150 m, 8-10-IV-66.

GUÁRICO: 1 female ex *Pteronotus parnellii*, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66.

LARA: 2 females ex *Pteronotus parnellii*, 10 km NE El Tocuyo, Caserio Boro, El Tocuyo, 528 m, 14-VII-68.

MIRANDA: 1 male and 1 female ex *Pteronotus parnellii*, 4 km SW Birongo, Cueva Walter Dupouy, Birongo, 195 m, 28-I-68; 4 males and 4 females, same host, Birongo, 60 m, 22-23-I-68; 1 male, same host, 5 km NNW Guarenas, Curupao, 1,160 m, 6-X-66.

T. F. AMAZONAS: 1 male ex *Pteronotus parnellii*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 17-III-67; 1 male, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-IV-67; 4 males and 9 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-25-VII-67.

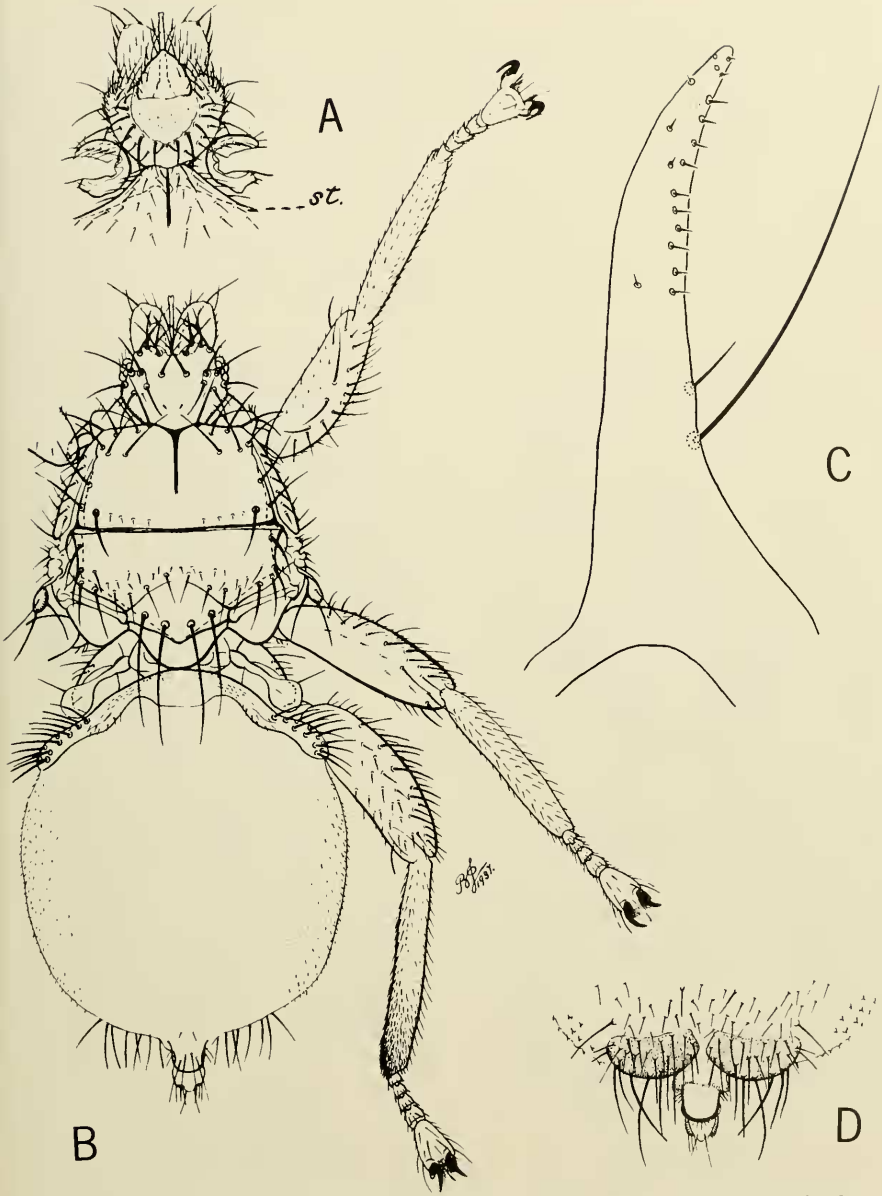

Fig. 17. *Trichobius sparsus* Kessel, female: A, underside of head and anterior part of thorax; B, dorsal view, female; C, left postgonite, male; D, apex of venter, female abdomen. A, B, D from Jobling (1938). C, from Wenzel et al. (1966).

HOST ASSOCIATIONS

All but 1 of the 112 specimens of *T. sparsus* collected by the survey teams in Venezuela were from *Pteronotus parnellii*, the host of Kessel's type specimen.

Trichobius parasparsus, new species
(Fig. 18B, 19B)

Trichobius parasparsus superficially closely resembles *T. sparsus* Kessel, and the West Indian species *T. cernyi* and *T. robynae*, recently described by Peterson and Hurka (1974). However, *parasparsus* females possess a very large tergum 7, which is normally continuous with the broad supra-anal plate, and both of these are wider than the proctiger—the supra-anal plate conspicuously so—and the ventral arc is very broad with conspicuous lateral flanges. In the three other species, tergum 7 is very small and inconspicuous (sometimes scarcely discernable even in alcohol-preserved specimens), conspicuously narrower than the proctiger, and separated from the supra-anal plate—which is scarcely if at all wider than the proctiger—and the ventral arc lacks conspicuous lateral flanges. Also, in *cernyi* there are only 3 terminal macrosetae on the supra-anal plate (4 in the other species). Males of *parasparsus* agree with those of *robynae* and *cernyi* in that sternum 5 is absent (not sclerotized) and sternum 6 is present, while the

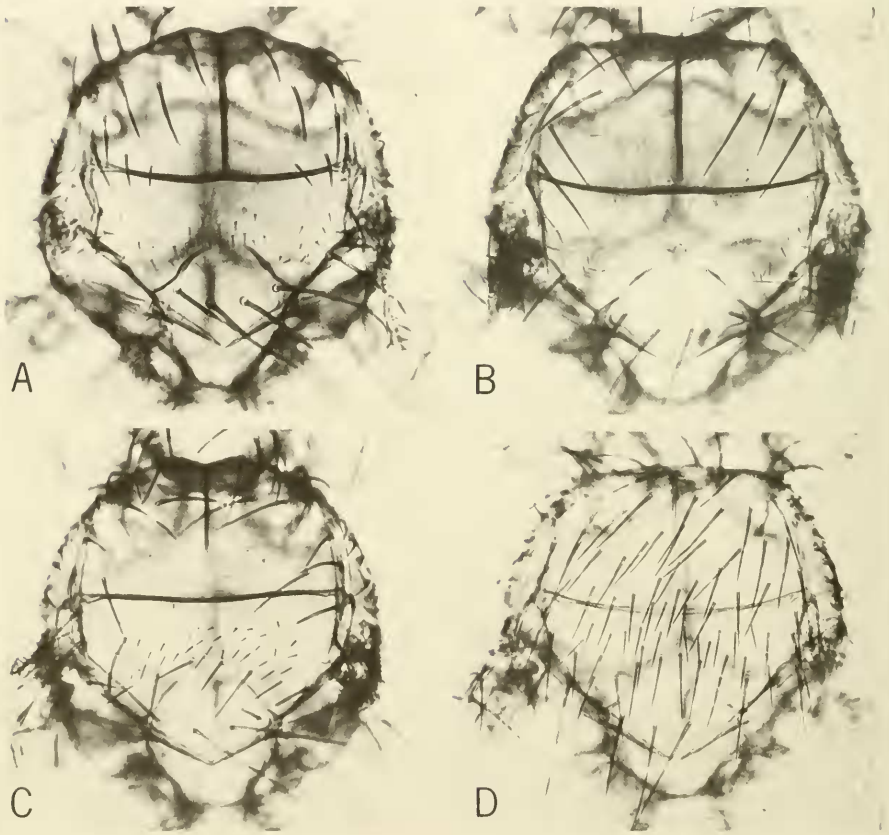

Fig. 18. Thorax, dorsal view, of species of *Trichobius major* group: A, *Trichobius leionotus*, new species, male (SVP 12686); B, *Trichobius sphacronotus* Jobling, female (SVP 44423); C, *Trichobius parasparsus*, new species (female allotype); D, *Trichobius longipilis*, new species, female (SVP 43226).

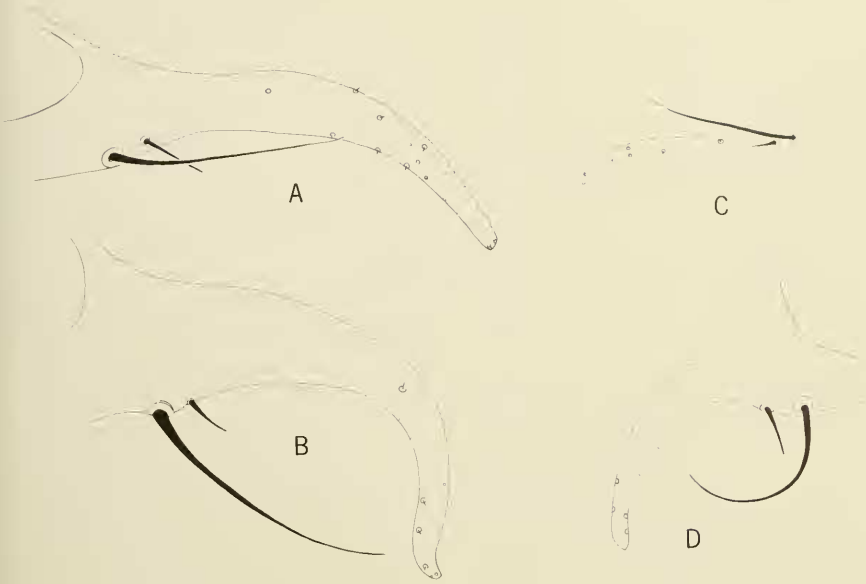

Fig. 19. Postgonites, *Trichobius major* group: A, *Trichobius sphaeronotus* Jobling (SVP 44423); B, *Trichobius parasparsus*, new species (SVP 6026); C, *Trichobius longipilis*, new species (holotype); D, *Trichobius lcionotus*, new species (SVP 20461).

reverse is true of *sparsus*. However, *parasparsus* males may be recognized by the strongly curved postgonites, which are nearly straight or feebly curved in *sparsus* and *robynae* and moderately curved in *cernyi*. Further, *T. parasparsus*, like *sparsus* and *cernyi* differs from *robynae* in that the transverse row of microsetae on the presentum near the transverse suture is broadly interrupted. This row is complete in *robynae*. However, in some individuals of both *sparsus* and *parasparsus*, an additional prescutal microseta may be located on each side of midline, and, when this is true, the transverse row may superficially appear to be complete.

Description

Head. As in *T. sparsus*. *Thorax.* Scutum with at least 2 rows of short setae at middle immediately in front of the antescutellars; microtrichia present along sides only (throughout setose area in *sparsus*), these lacking on scutellum (present on anterior half in *sparsus*). Anterior margin of mesosternum feebly rounded (feebly but distinctly emarginate in *sparsus*). *Abdomen.* Female. Tergum 7 large, distinctly wider than proctiger, usually about twice as long as broad, variable in shape, either parallel sided, elliptical, or pear shaped, usually connected with the supra-anal plate, and with 2 pairs of rather short setae, the anterior pair longer, situated just distal to midlength; supra-anal plate with 4 macrosetae in a transverse row (middle pair displaced anteriorly in *sparsus*) and with a row of 4 very short, rather evenly separated setae along basal margin, and an additional stronger seta on each lateral margin (a widely separated pair of short setae on each side along basal margin, the outer seta of each pair stronger, in *sparsus*). Seventh sternites small, each about as wide as ventral arc (twice as wide as arc in *sparsus*) with about 18-20 setae (25-30 in *sparsus*), including 4-5 macrosetae (9-10 in *sparsus*), the rest shorter. Ventral arc with conspicuous lateral lobelike flanges.

Male. Sternum 5 absent, 6 well developed. Postgonites (Fig. 19B) strongly curved, almost hooklike, slightly recurved at apex; ventral macroseta inserted basally, the very short accessory seta inserted distal to it along ventral margin; other setae very short. Other characters as in *T. sparsus*.

MEASUREMENTS

	Males	Females
BL	1.65-1.88	1.88-2.13
TL	0.63-0.66	0.69-0.71
WL	1.51-1.65	1.72-1.77
WW	0.74-0.81	0.81-0.87

TYPE DATA: Male holotype and female allotype ex *Pteronotus parnellii* (SVP 9390), Venezuela, Bolívar, 59 km SE El Dorado, Km74, El Manaco, 150 m, 14-VI-66.

PARATYPES—APURE: 1 male and 3 females ex *Pteronotus parnellii*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 24-28-XII-65; 1 male and 1 female, same host, 1 km W Pto. Páez, Cerro de Murcielagos, Pto. Páez, 76 m, 19-I-66.

BOLÍVAR: 1 male and 3 females ex *Pteronotus parnellii*, 56 km SE El Dorado, Km 67, El Manaco, 150 m, 16-VI-66; 1 male and 3 females, same host, same locality data as the holotype except for 13-14-VI-66; 2 males and 3 females, same host, 5 km NNW Guasipati, Guasipati, 190 m, 29-IV-66; 1 male, same host, 20 km W La Paragua, Hato San José, 306 m, 10-IV-67; 3 males and 6 females, same host, 85 km SSE El Dorado, Km 125, 882-1,032 m, 11-16-V-66; 1 female, same host, 28 km SE El Manteco, Los Patos, 350 m, 11-IV-66; 2 males, same host, 50 km SE El Manteco, Río Supamo, 150 m, 8-10-IV-66.

FALCÓN: 1 male ex *Sturnira lilium*, 2 males and 2 females ex *Pteronotus parnellii*, 19 km NW Urama, Km 40, Urama, 25 m, 15-27-X-65; 9 males and 5 females, same host, 14 km ENE Mirimire, nr. La Pastora, 60 m, 23-XI-67; 2 females, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-XI-67.

T. F. AMAZONAS: 1 male ex *Sturnira lilium*, 1 male ex 1 *Sturnira tildae*, 1 female ex 1 *Uroderma bilobatum*, 1 male and 1 female ex 2 *Carollia perspicillata*, 20 males and 15 females ex *Pteronotus parnellii*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I—9-II-67; 5 males and 6 females, same host, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 3-II-67; 4 males and 6 females, same host, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 17-24-III-67; 25 males and 15 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-11-IV-67; 14 males and 17 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 12-27-VII-67; 1 male and 1 female, same host, Río Orinoco, Tamatama, 135 m, 27-IV-67.

YARACUY: 1 male and 1 female ex *Pteronotus parnellii*, 20 km NW San Felipe, Minas de Aroa, 385-395 m, 14-19-XII-67.

HOST ASSOCIATIONS

Of 191 specimens of *T. parasparsus* collected by the survey teams in Venezuela, 185 (97 percent) were from 63 *Pteronotus parnellii*. The other 6 specimens, from 4 hosts, almost certainly represent transitory transfers and/or contaminations. The characteristic host is clearly *P. parnellii*, on which *parasparsus* occurs together with *T. sparsus*.

REMARKS

Interestingly, a very similar species has been taken in Guatemala on *P. davyi*, *Mormoops m. megalophylla*, *Balantiopteryx io*, and *Natalus stramineus*, but not on *P. parnellii*, though *T. sparsus* was taken from that host at another locality.

Trichobius sphaeronotus Jobling

(Fig. 1A-C; 3A. C; 6A, B; 19A, 18B)

Trichobius sphaeronotus Jobling, 1939a:494, Fig. 4A-C.

VENEZUELAN SURVEY RECORDS (320 males, 309 females, 13 sex undet.)

FALCÓN: 1 male and 1 female ex *Glossophaga longirostris*, 1 male and 2 females ex *Leptonycteris curasoae*, Capatárida, 40-55 m, 24-VI—14-VII-68; 7 males and 13 females, same host, 25 km SW Pueblo Nuevo, Yabuquiva, Península de Paraguaná, 13 m, 17-18-VII-68; 9 males and 9 females, same host, 7 km W Pueblo, Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 10-11-VII-68.

GUAJIRA: 1 male ex *Leptonycteris curasoae*, 37 km NNE Paraguaipoa, nr. Cojoro, 15 m, 28-VI-68.

LARA: 2 females ex 2 *Pteronotus parnellii*, 1 male ex *Glossophaga longirostris*, 2 males and 3 females ex *Rhogeessa minutilla*, 267 males, 246 females, and 13 sex undet. ex *Leptonycteris curasoae*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 528 m, 14-16-VII-68; 3 males and 1 female, same host, 47 km NE El Tocuyo, La Concordia, El Tocuyo, 592 m, 23-24-VII-68.

NUEVA ESPARTA: 6 males and 4 females ex *Leptonycteris curasoae*, 3 km NE La Asunción, Isla Margarita, 305 m, 20-I-67; 4 males and 8 females, same host, 3 km S La Asunción, Isla Margarita, 53 m, 21-I—7-II-67.

SUCRE: 1 male ex *Leptonycteris curasoae*, 16 km E Cumaná, 1 m, 21-XII-66.

ZULIA: 7 males and 15 females ex *Leptonycteris curasoae*, 35 km NNE Paraguaipoa, nr. Cojoro, 5-15 m, 20-VI—1-VII-68; 10 males

and 5 females, same host, 36 km NNE Paraguaipoa, nr. Cojoro, 15 m, 30-VI–1-VII-68.

Measurements

	Males (5)	Females (4)
BL	1.66-1.78	1.78-2.40
TL	0.60-0.63	0.66-0.70
WL	1.58-1.62	1.61-1.90
WW	0.73-0.87	0.83-0.87

Host Associations and Distribution

Of 630 specimens of *Trichobius sphaeronotus* collected by the survey teams, 619 (96.6 percent) were from 152 *Leptonycteris curasoae*. The other 11 specimens probably represent transitory transfers or contaminations that occurred in the collecting.

As in the case of *Nycterophilia coxata*, *T. sphaeronotus* exhibits a disjunct distribution between Mexico and South America that appears to correlate with the distribution of the host genus *Leptonycteris*. It should be noted that all published records of *T. sphaeronotus* from *Leptonycteris* give *L. nivalis* as the host. The type (Mexico: Nuevo Leon; San Luis Potosi) is probably from that host, as are specimens recorded from Texas. However, the specimens recorded from New Mexico and Arizona are probably from *Leptonycteris sanborni*. I have examined specimens from both *nivalis* and *sanborni*, including several dozen specimens of the series from which Jobling described *sphaeronotus*, and find no differences between them, though the two hosts appear to be adapted to different biotopes (Baker and Cockrum, 1966).

Remarks

As is true for *Nycterophilia coxata*, there are slight differences between the North American and Venezuelan populations of *T. sphaeronotus*. The number of scutal setae in the W-shaped antescutellar row range from 28-32, with an average of 30.75 in Venezuelan specimens and from 24-31 in North American specimens, with an average of 25. Further, in North American specimens there is a very strong seta at each basal angle of the W of this row; this seta is usually about half as long as the macroseta immediately lateral to it. In the Venezuelan specimens, this seta is sometimes slightly stronger than but usually of about the same size as the minute setae of the W-shaped row.

One may argue that the North and South American population represent distinct species, but until further information indicates otherwise, I consider them to be geographic disjuncts of the same species.

Trichobius leionotus, new species
(Fig. 18A, 19D)

Trichobius n. sp., Whitaker and Easterla, 1975: 243:244

Superficially resembling *sphaeronotus* but differing as follows: Size smaller. Thorax narrower, subglobose, about as wide as deep (wider than deep in *sphaeronotus*), anterior margin distinctly produced and bilobed at middle (subtruncate or feebly produced in *sphaeronotus*); prescutum with 18 macrosetae rather than 14, including 2 on each side anterior to transverse suture (these 2 are microsetae in *sphaeronotus*); scutum with a double rather than a single W-shaped row of very short antescutellar setae. Femora more densely setose above. Female. Seventh sternites small, rather evenly oval, setose throughout, the setae mostly fine and short, without a conspicuous bare area (larger, inner posterior margins strongly oblique and bare, setae strong, none very short, in *sphaeronotus*). Male. Sternum 5 divided into 2 sternites (complete, though apical margin may be emarginate and midline impressed in *sphaeronotus*). Postgonites strongly curved from base, hooklike, at right angles to hypandrium (distally curved but not hooklike in *sphaeronotus*); aedeagus strongly troughlike except distally (not so in *sphaeronotus*).

Description

Head. Eyes with 7-8 facets. Lateravertices and occipital lobes not clearly defined, the lobes each with about 7 strong setae, and 2 minute ones along posterior margin. Palpi as in *T. sphaeronotus*.

Thorax. Light yellow, "subglobose," about as wide as deep, distally convex. Mesonotum with rather deep longitudinal and transverse integumental striations; median and transverse sutures united; prescutum with 18 macrosetae, 2 of these on each side near lateral margin anterior to transverse suture; scutum with an irregularly double W-shaped antescutellar row of microsetae and with 4 macrosetae along each lateral margin.

Wings. Very similar to those of *sphaeronotus*.

Legs. Femora dorsally with more numerous long setae than in *sphaeronotus*.

Abdomen. Lateral lobes of tergum 1+2 with ± 17-18 mostly strong setae of varying lengths, several very short and fine. Female. Tergum 7 transverse, typically with 2, rarely 3, pairs of short setae, the posterior pair longer and farther apart; supra-anal plate uniformly sclerotized and pigmented, with 4 fine distal macrosetae, and on each side a row of 3 short discal setae in an

oblique row. Seventh sternites rather evenly oval, a little broader than long, without any bare areas, with + 30 slender setae, mostly short, but including 1-2 macrosetae, the setae becoming shorter anteriorly, those near margin very short. MALE. Sternum 5 divided, with longer setae on apical margins, the outer ones longer; sternum 6 almost threadlike and usually inflexed at middle; sternum 7 + 8 with + 30 fine setae, 1 a macroseta, the dorsal ones longer, the others becoming shorter ventrad. Postgonites strongly curved, hooklike, the ventral accessory seta inserted distal to the macroseta. Aedeagus troughlike except distally.

MEASUREMENTS

	Males	Females
BL	1.23-1.48	1.56-1.72
TL	0.47-0.52	0.54-0.57
WL	1.32-1.45	1.64-1.69
WW	0.65-0.74	0.80-0.81

TYPE DATA: Male holotype, female allotype, 2 males and 1 female paratype ex *Mormoops megalophylla* (FMNH 64961-83) and 1 male and 1 female paratype ex *Pteronotus davyi fulvus* (FMNH 65140-65), Guatemala, Alta Vera Paz, Lanquin, Cueva de Lanquin, 1,000 m, 31-V-48, Rodger D. Mitchell and Luis de la Torre (FMNH Guatemala Zoological Expedition, 1948). In the collection of Field Museum of Natural History.

PARATYPES—ECUADOR. 2 males (CNC) (D.C. = 5131) ex *Mormoops megalophylla*, Carchi, Gruta Rumichaca, 2 mi E La Paz, 8,700 ft, 4-VII-64, D. C. Carter.

TRINIDAD. 2 males and 5 females (FMNH), "aspirated from wall of a cave," Central Road, Mt. Tamana Cave, 29-VII-67, Johanna Darlington; 11 females (FMNH), same data but from "light trap" in cave. USA. TEXAS: 1 male and 1 female (FMNH) ex *Mormoops megalophylla*, Uvalde Co., 20 mi N Uvalde, Frio Cave, 24-I-70, Tony Mollhagen.

VENEZUELA. BOLÍVAR: 2 males and 2 females ex *Mormoops megalophylla*, 20 km W La Paragua, Hato San José, 306 m, 10-IV-67; FALCÓN: 1 male, same host, 7 km W Pueblo Nuevo, Cueva del Guano, Península de Paraguaná, 120 m, 23-VII-68; SUCRE: 1 male and 1 female, same host, 10 km NE Güiria, Ensenada Cauranta, 90 m, 7-VI-67; YARACUY: 6 males and 1 female, same host, 20 km NW San Felipe, Minas de Aroa, 395 m, 11-13-XII-67.

HOST ASSOCIATIONS

Mormoops megalophylla appears to be the characteristic host of *Trichobius leionotus*.

REMARKS

I have seen only 2 specimens from Texas (see above). Whitaker and Easterla (1975:244) reported 159 specimens that are probably this species from 9 *Mormoops megalophylla* at Big Bend National Park, Texas.

Trichobius longipilis, new species
(Fig. 18D, 19C)

Easily distinguished from all other species of *Trichobius* by the following combination of characters: the fairly long, relatively uniform setae of the mesonotum, the very short, pointed metasternal lobe, the undivided female sternum 7, and the divided male sternum 5.

DESCRIPTION

A rather deeply pigmented species. *Head.* Eyes rather prominent but with only 7 facets. Anterior margins of occipital lobes not well defined; laterovertices with 5 strong and 1 short setae; occipital lobes each with 6 strong, long setae—most of them longer than occipital lobes are wide—and 3-4 very short setae along posterior margin of each lobe or just below them. Palpi slightly elongate oval, the apical margins rounded, with strong setae throughout on ventral surface, a shorter seta inserted between the long, ventrally directed seta and the lateral margin. Theca elongate; margins of oral cavity rather strongly convergent.

Thorax. With apical margin subtruncate or feebly arcuate, usually very slightly produced medially, and feebly emarginate at midline; transverse suture usually complete, though sometimes ill defined medially in males; longitudinal suture clearly united with the transverse suture in females, usually indistinct for about a fourth to third of its length anterior to the transverse suture and not united with the transverse suture (or indistinctly so) in the males; prescutum rather evenly setose, all the setae long, those near middle slightly denser and a trifle shorter, about 23-24 setae on each side of median suture; scutum rather evenly covered with setae that are of about the same length as the shorter setae on prescutum except that there are about 4 macrosetae along lateral margin and an antescutellar row of 9-10 longer setae; scutellar setae not conspicuously long. Mesosternum moderately strongly projecting between the front coxae, the ventral margin distinctly, angulately emarginate; metasternal lobe very short, pointed.

Wings. Third cross-vein much closer to second than to first; setae of underside of wing veins mostly limited to apical half of wing, excepting R_1 which is setose for its entire length.

Legs. Profemora rather short, outer face clothed with very short but conspicuous setae; upper surface with shorter setae basally, these becoming longer, stronger and more numerous on distal ⅔, those near apex shorter. Midfemora mostly clothed with short recumbent setae, upper surface with a few conspicuously stronger and longer ones on distal half, shorter again near apex. Hindfemora covered with somewhat longer setae than pro- and midfemora on sides and ventral surface, and with dense, strong setae on dorsal surface, these shorter but conspicuous on about basal third or half and becoming conspicuous macrosetae distally.

Abdomen. Lateral lobes of tergum 1+2 with 25-30 strong setae, mostly macrosetae, those along posterior margins of lobe noticeably longer. Female. Lateral abdominal connexivum with minute setae, these somewhat longer ventrally, without a cluster of coarser setae behind lateral lobe of tergum 1+2. Tergum 7 transverse, oval, with 2 pairs of widely separated setae arranged in a row, inner pair longer; tergum connected by a narrow sclerotized strap to the rather broad supra-anal plate, which has 4 distal macrosetae and, on each side, a pair of somewhat stronger macrosetae. Sternum 1+2 rather uniformly covered with short setae, these mostly slightly longer than the ventral connexival setae and a little longer along posterior margin, especially around posterolateral angles. Sternum 7 not divided into 2 distinct sternites, rather short, except along middle of hind margin which extends posteriorly as a broad short flap that terminates in a sclerotized transverse "bar," this about same width as the ventral arc; sternum slightly indented along anterior margin; surface covered with shorter setae along middle of disc and anterior margin, these becoming very long outwardly where there are 5-6 conspicuous macrosetae on each side; most setae of posterior margins distinctly longer than the discals. Male. Sternum 5 divided into 2 large transverse sternites; setae along posterior margins of the sternites longer than the discals and becoming at least twice as long toward lateral margins. Sternum 6 present, well defined. Sternum 7+8 with ± 11-12 setae, some of them short, most of them of moderate length; tergum 9 with 16-17 setae, these mostly stronger and more conspicuous than those of sternum 7+8. Postgonites (Fig. 19C) long slender, evenly curved apically, strongly sinuate above; ventral macroseta inserted far anteriorly (basally), the accessory seta very short, inserted close to and distal to the macroseta; other setae absent, replaced by sensillae.

Measurements

	Males	Females
BL	1.61-1.80	1.84-2.08
TL	0.54-0.60	0.65-0.67
WL	1.41-1.59	1.69-1.83
WW	0.58-0.70	0.74-0.84

Type Data: Male holotype and female allotype (SVP 43181) ex *Peropteryx macrotis*, Venezuela, Bolívar, 13 km NE Icabarú, Icabarú, 817 m, 8-V-68. Paratypes—VENEZUELA. Bolívar: 1 male and 1 female ex *Peropteryx macrotis*, 11 km NE Icabarú, Icabarú, 750 m, 9-V-68; 3 males and 3 females, same host, same data as the holotype; 1 male, same host, 70 km SSE El Dorado, Piedra Virgen, Km 125, 374 m, 29-V-66.

PANAMA. Canal Zone: 1 male and 3 females (FMNH), XI-68.

Other Material Examined

PERU. Madre de Dios: 2 badly damaged specimens (FMNH), sex undet., ex *Peropteryx* sp., La Pampa, 23-X-41, C. C. Sanborn.

In addition to these, I have on hand 3 males and 3 females (FMNH) ex *Peropteryx m. macrotis* collected in 1948 at two localities in Guatemala (Escuintla) by Luis de la Torre and Rodger D. Mitchell. I tentatively assign them to *longipilis*, though the discal prescutal and scutal setae appear to be distinctly shorter than in specimens of the type series. The male postgonites appear to be identical.

Host Associations

Trichobius longipilis is known only from *Peropteryx* species and is the only species of the genus that is known to parasitize emballonurid bats.

Remarks

The male sternum 5 and female sternum 7 are very lightly sclerotized and rather difficult to discriminate in alcohol specimens, almost impossible to see in slide preparations. The postgonites of males from *Peropteryx kappleri* appear to be very slightly shorter than those from *P. macrotis*, but I am unable to detect any other differences in specimens from these two hosts.

Trichobius uniformis group

Excepting *Trichobius keenani*, whose characteristic hosts are species of *Micronycteris*, the

members of this group parasitize glossophagine bats.

Trichobius keenani Wenzel
(Fig. 21A)

Trichobius keenani Wenzel, 1966:462, Fig. 60A
VENEZUELAN SURVEY RECORDS (4 males, 1 female)

APURE: 1 male ex 1 *Carollia perspicillata*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 21-I-68.

BARINAS: 1 male ex *Micronycteris megalotis*, 2 km SW Altamira, Altamira, 609 m, 3-I-68.

T. F. AMAZONAS: 1 female ex *Micronycteris megalotis*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 13-IV-67; 2 males ex 1 *Micronycteris microtis*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 21-II-66.

REMARKS

The Panamanian host of the type series of *Trichobius keenani* was "*Micronycteris megalotis microtis*."

Trichobius lionycteridis Wenzel
(Fig. 21C)

Trichobius lionycteridis Wenzel, 1966:464, Fig. 60C

VENEZUELAN SURVEY RECORDS (99 males, 72 females, 1 sex undet.)

APURE: 1 male ex *Carollia perspicillata*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 2-I-68.

BOLIVAR: 1 male and 1 female ex 1 *Sturnira lilium*, 1 male ex 1 *Vampyrops helleri*, 16 males and 15 females ex *Lionycteris spurrelli*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 9-25-VI-66; 1 sex undet. ex *Carollia perspicillata*, 39 males and 26 females ex *Lionycteris spurrelli*, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 2-8-V-68; 3 males, same host, 11 km NE Icabarú, Icabarú, 750 m, 9-V-68; 2 males and 2 females, same host, 13 km NE Icabarú, Icabarú, 817 m, 8-V-68; 1 male and 1 female, same host, 23 km NE Icabarú, El Pauji, Icabarú, 824 m, 27-IV-68;

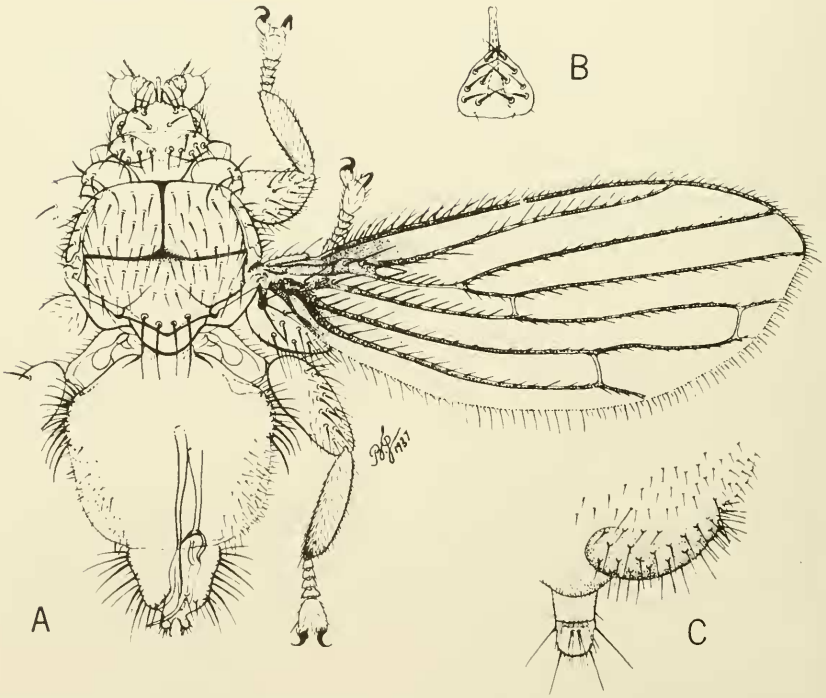

Fig. 20. *Trichobius lonchophyllae* Wenzel, male: dorsal view. From Jobling (1938; as *Trichobius uniformis* Curran).

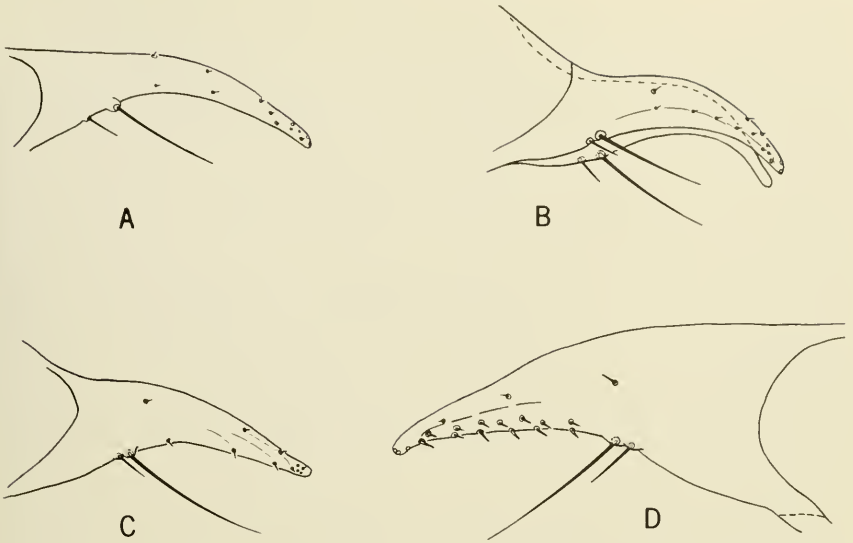

Fig. 21. A-C, male postgonites, *Trichobius uniformis* group: A, *Trichobius keenani* Wenzel; B, *Trichobius uniformis* Curran; C, *Trichobius lionycteridis* Wenzel. D, *Trichobius lonchophyllae* Wenzel.

8 males and 6 females, same host, 85 km SSE El Dorado, Km 125, 871-1,032 m, 10-19-V-66.

T. F. AMAZONAS: 1 male ex 1 *Molossus aztecus*, 13 males and 12 females ex *Lionycteris spurrelli*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 15-28-VII-67; 1 female, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 1-I-67; 1 male and 1 female, same host, Cabecera del Caño Culebra, 40 km NNW Esmeralda, Cerro Duida, 1,400 m, 6-II-67; 1 male, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 12-IX-67; 2 males and 2 females, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-X-67; 9 males and 5 females, same host, Río Orinoco, Tamatama, 135 m, 1-15-V-67.

Host Associations

Of 172 specimens of *Trichobius lionycteridis* collected by the survey teams, 166 (96.5 percent) were from 79 *Lionycteris spurrelli* and the remaining 6 were from 5 bats of 4 species.

Trichobius lonchophyllae Wenzel
(Fig. 20, 21D)

Trichobius lonchophyllae Wenzel, 1966:461, Fig. 59A-C, 60D, 61A

Venezuelan Survey Records (49 males, 64 females)

BARINAS: 18 males and 24 females ex *Lonchophylla robusta*, 2 km SW Altamira, Altamira, 609-620 m, 26-XII-67—4-I-68; 4 males and 6 females, same host, 1 male ex 1 *Sturnira lilium*, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67; 6 males and 6 females ex *Lonchophylla robusta*, Altamira, 794 m, 20-XII-67—10-I-68.

ZULIA: 11 males and 17 females ex *Lonchophylla robusta*, 21 km SW Machiques, Kasmera, 270 m, 17-23-IV-68; 1 male and 3 females, same host, 19 km WSW Machiques, Novito, 1,135 m, 2-V-68; 8 males and 8 females, same host, 33 km NW La Paz, nr. Cerro Azul, 75 m, 15-VI-68.

Trichobius uniformis Curran
(Fig. 21B)

Trichobius uniformis Curran, 1935:10 (part), Fig. 8.—Wenzel, Tipton, and Kiewlicz, 1966: 459, Fig. 60B, 61B.

Venezuelan Survey Records (119 males, 97 females, 5 sex undet.)

APURE: 1 male ex *Glossophaga longirostris*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 8-XII-65; 1 male and 1 female, same host, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 14-16-XII-65.

BARINAS: 2 males ex *Glossophaga soricina*, 2 km SW Altamira, Altamira, 609-620 m, 27-XII-

67—1-I-68; 2 males and 1 female, same host, Altamira, 794 m, 20-XII-67.

BOLÍVAR: 1 male ex 1 *Vampyrops helleri*, 12 males and 10 females ex *Glossophaga soricina*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 8-25-VI-66; 2 males and 1 female ex *Glossophaga longirostris*, 7 males, 7 females, and 1 sex undet. ex *Glossophaga soricina*, 20 km W La Paragua, Hato San José, 300-306 m, 1-10-IV-67; 1 sex undet. ex *Glossophaga longirostris*, 47 km ESE Caicara, Hato La Florida, 50 m, 4-V-67; 4 males and 1 female ex *Glossophaga soricina*, 56 km SE El Dorado, Km 67, El Manaco, 150 m, 16-VI-66; 12 males and 10 females, same host, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 8-25-VI-66; 1 male, same host, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 29-IV-68; 1 male and 1 female, same host, 85 km SSE El Dorado, Km 125, 1,032 m, 11-17-V-66; 1 male, same host, 50 km SE El Manteco, Río Supamo, 150 m, 8-IV-66.

CARABOBO: 1 male and 1 female ex *Glossophaga soricina*, 2.5 km NW Urama, Urama, 25 m, 14-XI-65; 2 males and 2 females, same host, 6 km ENE Urama, Urama, 25 m, 6-III-66.

FALCÓN: 1 male and 1 female ex 1 *Anoura geoffroyi*, 2 males ex *Glossophaga soricina*, 14 km ENE Mirimire, nr. La Pastora, 122 m, 11-XI-67; 1 male, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 1-XII-67; 2 males, same host, 80 km NW Carora, Río Socopito, 470 m, 22-V-68; 3 females ex *Glossophaga longirostris*, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 23-IX-65; 1 male, same host, 20 km NNE Mirimire, nr. Aguide, 5 m, 13-XI-67.

GUÁRICO: 1 male and 1 female ex *Glossophaga soricina*, 9 km SE Calabozo, Est. Biol. de los Llanos, 100 m, 20-VIII-68; 1 female, same host, 35 km SSW San Juan de los Morros, Hto. Las Palmitas, 181 m, 7-I-68.

MIRANDA: 1 female ex *Glossophaga soricina*, 1 km S Río Chico, 1 m, 24-X-66; 2 males and 2 females, same host, 7 km N Río Chico, nr. Paparo, 1 m, 15-16-XI-66; 7 males and 5 females, same host, Birongo, 60 m, 22-23-I-68; 1 male, same host, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 30-IX-66.

MONAGAS: 1 male ex *Glossophaga soricina*, 3 km NW Caripe, nr. San Agustín, 175 m, 12-VII-67.

SUCRE: 1 male and 1 female ex *Glossophaga longirostris*, 8 males and 9 females ex *Glossophaga soricina*, 9 km NE Güiria Ensenada Cauranta, 1-7 m, 3-16-VI-67; 1 male and 1 female, same host, 16 km E Cumaná, ? m, 7-XII-66; 3 males and 4 females, same host, 12 km NE Güiria, Ensenada Cauranta, 90-100 m, 17-19-VI-67.

T. F. AMAZONAS: 2 males ex 1 *Artibeus lituratus*, 19 males, 16 females, and 2 sex undet. ex *Glossophaga soricina*, 1 male ex *Glossophaga longirostris*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 6-27-VII-67; 1 female, same host, 1 male and 3 females ex *Glossophaga soricina*, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-8-X-67; 4 males and 2 females, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 1-3-I-67; 1 male, same host, 14 km SSE Pto. Ayacucho, Chaparito, Pto. Ayacucho, 119 m, 2-X-67; 3 males and 3 females, same host, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 24-VII—27-IX-67; 1 male, 2 females, and 1 sex undet., same host, 28 km S. Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-12-X-67; 2 males and 3 females, same host, Río Orinoco, Tamatama, 135 m, 28-IV—7-V-67.

TRUJILLO: 1 male ex *Glossophaga soricina*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 14-IX-65; 1 male, same host, 25 km NNW Valera, Agua Santa, Valera, 90 m, 3-IX-65.

YARACUY: 7 males and 5 females ex *Glossophaga soricina*, 1 male ex 1 *Carollia perspicillata*, 20 km NW San Felipe, Minas de Aroa, 395-400 m, 6-13-XII-67.

ZULIA: 3 males and 5 females ex *Glossophaga soricina*, 21 km SW Machiques, Kasmera, 270 m, 14-19-IV-68; 2 males and 3 females, same host, 19 km WSW Machiques, Novito, 1,135 m, 4-V-68.

Other Venezuelan Material Examined

CARABOBO: 2 males, host unknown, Yuma, 9-IV-49, F. Fernandez Y.; 1 female, *Myotis* sp., same locality data.

Host Associations

Of 221 specimens of *Trichobius uniformis* collected by the survey teams, 200 (90.5 percent) were from 128 *Glossophaga soricina*, 15 (6.8 percent) ex 11 *G. longirostris*, and the remaining 6 ex 4 bats of 4 species.

Trichobius dugesii group

Many of the species of this group are extraordinarily similar in most characters, and identification can be very difficult or impossible without authoritatively identified comparative material.

Although the male postgonites are usually distinctive, they are difficult to use for routine identification because they may be twisted and curved laterally (see above under Genus *Trichobius*).

Trichobius dugesii complex

Trichobius dugesii Townsend

(Fig. 22A, 25G, H)

Trichobius dugesii Townsend, 1891:106.—Wenzel, Tipton, and Kiewlicz, 1966:478, Fig. 68G-H, 69A.

Trichobius blandus Curran, 1935:10, Fig. 11.

Venezuelan Survey Records (210 males, 141 females, 3 sex undet.)

APURE: 1 male and 2 females ex *Glossophaga soricina*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 30-I-68; 42 males and 36 females ex *Glossophaga longirostris*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 6-28-XII-65; 2 males, same host, 46 km NE Pto. Páez, Río Cinarueo, Hato Cariben, 76 m, 14-16-XII-65; 2 males and 1 female, same host, 1 km W Pto. Páez, Cerro de Murcielagos, Pto. Páez, 76 m, 24-I-66.

BARINAS: 9 males, 8 females, and 1 sex undet. ex *Glossophaga soricina*, 2 km SW Altamira, Altamira, 609-620 m, 26-XII-67—5-I-68; 1 male and 1 female, same host, Altamira, 794 m, 20-XII-67.

BOLÍVAR: 1 male and 1 female ex 2 *Micronycteris nicefori*, 25 km SE El Manteco, Los Patos, 150 m, 3-IV-66; 1 male and 1 female ex *Glossophaga soricina*, 56 km SE El Dorado, Km 67, El Manaco, 150 m, 16-VI-66; 11 males and 4 females, same host, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-25-VI-66; 8 males and 4 females, same host, 20 km W La Paragua, Hato San José, 300-306 m, 1-10-IV-67.

CARABOBO: 16 males and 16 females ex *Glossophaga soricina*, 2.5 km NW Urama, Urama, 25 m, 14-XI-65; 2 males and 1 female, same host, 5 km ENE Urama, Urama, 25 m, 6-III-66; 2 males and 1 female, same host, 6 km ENE Urama, Urama, 25 m, 6-III-66.

DTO. FEDERAL: 1 female ex *Glossophaga soricina*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 20-VIII-66.

FALCÓN: 10 males and 6 females ex *Glossophaga longirostris*, 1 male ex *Glossophaga soricina*, 20 km NNE Mirimire, nr. Aguide, 1-5 m, 13-XI-67; 1 male and 1 female, same host, 1 male and 3 females ex *Glossophaga longirostris*, Capatárida, 55 m, 23-25-VI-68; 1 male, same host, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 23-IX-65; 1 male and 2 females ex *Glossophaga soricina*, 14 km ENE Mirimire, nr. La Pastora, 122 m, 11-XI-67; 1 male and 1 female, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-29-XI-67; 1 female, same host, 13 km ESE Mirimire, nr. San Pablo, 270 m, 17-XI-67; 1 male, same host, 80 km NW Carora, Río Socopito, 470 m, 22-V-68.

GUAJIRA: 7 males and 3 females ex *Glossophaga longirostris*, 37 km NNE Paraguaipoa, nr. Cojoro, 15 m, 26-VI—1-VII-68.

GUÁRICO: 2 males ex *Glossophaga longirostris*, 1 male ex *Glossophaga soricina*, 35 km SSW San Juan de los Morros, Hto. Las Palmitas, 181 m, 7-I-68; 2 males, same host, 14 km SE Calabozo, nr. Río Orituco, Est. Biol. de los Llanos, 100 m, 21-VIII-68; 1 male, same host, 9 km SE Calabozo, Est. Biol. de los Llanos, 100 m, 20-VIII-68.

LARA: 7 males and 3 females ex *Glossophaga longirostris*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 521-537 m, 14-17-VII-68; 1 female and 1 sex undet., same host, 10 km NE El Tocuyo, San José, El Tocuyo, 580 m, 23-VII-68; 1 male, same host, 47 km NE El Tocuyo, La Concordia, El Tocuyo, 592 m, 24-VII-68.

MIRANDA: 1 male ex *Carollia brevicauda*, 5 km NNW Guarenas, Curupao, 1,180 m, 13-X-66; 1 male and 1 female ex *Glossophaga longirostris*, 2 females ex *Glossophaga soricina*, 1 km S Río Chico, 1 m, 23-26-X-66; 5 males, same host, Birongo, 60 m, 21-23-I-68; 2 males and 1 female, same host, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 23-24-IX-66.

MONAGAS: 1 female ex *Carollia brevicauda*, 3 km NW Caripe, nr. San Agustín, 1,275 m, 11-VII-67; 3 males and 2 females ex *Glossophaga soricina*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68.

NUEVA ESPARTA: 1 female ex *Glossophaga longirostris*, 1 km E La Guardia, Isla Margarita, 18 m, 18-I-67; 1 male, same host, 3 km NE La Asunción, Isla Margarita, 305 m, 20-I-67; 2 males, same host, 3 km NNE La Asunción, Isla Margarita, 38 m, 12-I-67; 2 males and 1 female, same host, 3 km S La Asunción, Isla Margarita, 53-65 m, 21-I—2-II-67.

SUCRE: 3 males and 1 female ex *Glossophaga longirostris*, 3 males ex *Glossophaga soricina*, 16 km E Cumaná, ? m, 7-22-XII-66; 1 male ex 1 *Molossus ater*, 14 km E Cumaná, 1 m, 8-XII-66; 1 male ex *Glossophaga soricina*, 21 km E Cumaná, ? m, 9-XII-66; 1 male, same host, 12 km NE Güiria,, Ensenada Cauranta, 100 m, 17-VI-67; 7 males, 4 females, and 1 sex undet., same host, 9 km NE Güiria, Ensenada Cauranta, 1-7 m, 3-16-VI-67.

T. F. AMAZONAS: 1 male and 2 females ex *Glossophaga longirostris*, 1 male and 1 female ex *Glossophaga soricina*, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m,

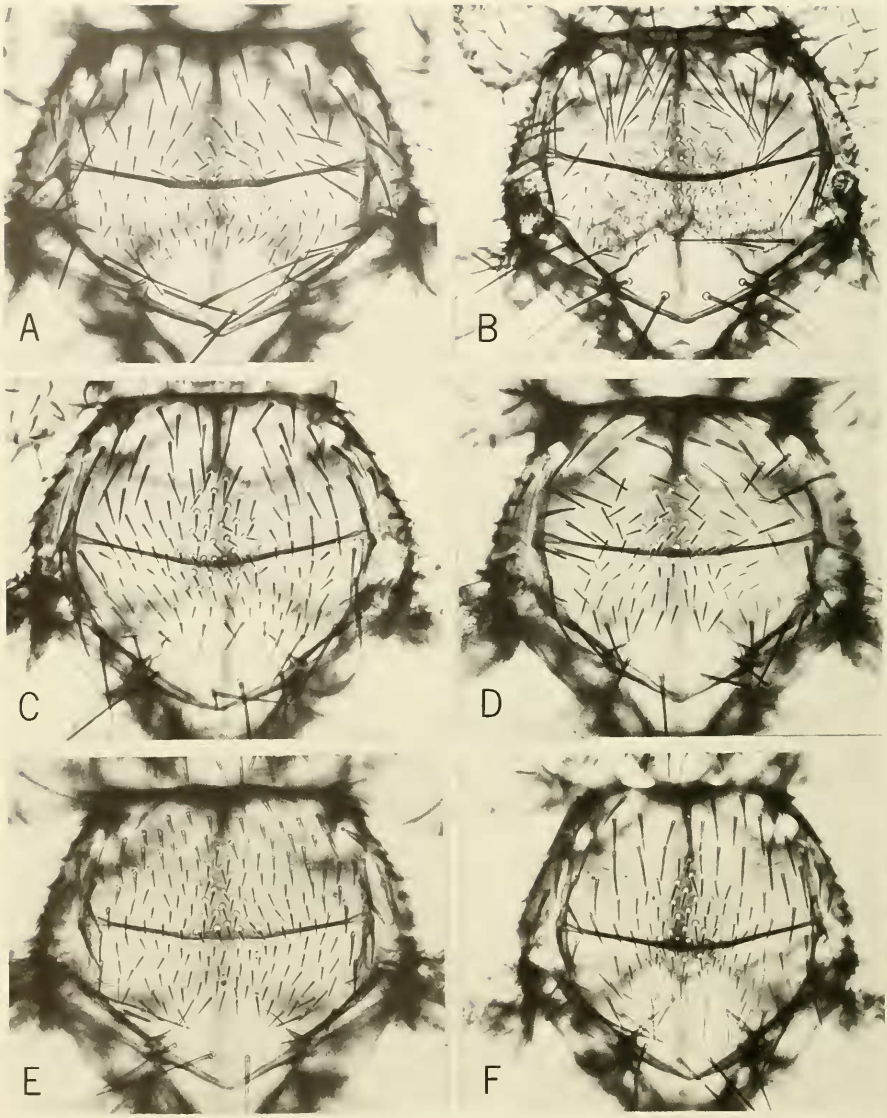

Fig. 22. Thorax, dorsal view, of species of *Trichobius dugesii* group: A, *Trichobius dugesii* Townsend, male; B, *Trichobius propinquus*, new species (allotype); C, *Trichobius persimilis*, new species (SVP 31957); D, *Trichobius joblingi* Wenzel; E, *Trichobius macrophylli* Wenzel, female; F, *Trichobius urodermae* Wenzel, female. A, D, E, F from Wenzel et al. (1966).

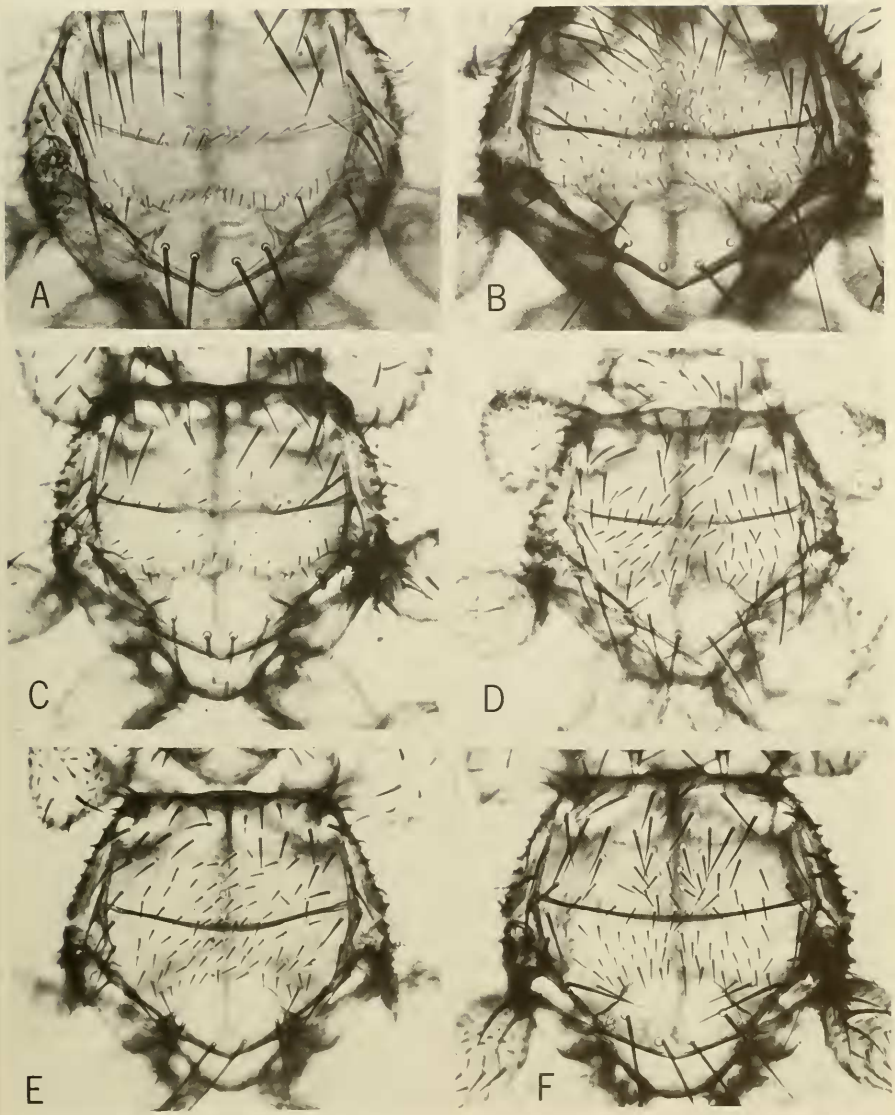

Fig. 23. Thorax, dorsal view, of species of *Trichobius dugesii* group: A, *Trichobius parasiticus* Gervais, male; B, *Trichobius diphyllae* Wenzel, male; C, *Trichobius diacmi*, new species, male (SVP 27821); D, *Trichobius ethophallus*, new species (male holotype); E, *Trichobius tuttlei*, new species, female (SVP 18706); F, *Trichobius flagellatus*, new species, female (SVP 2563). A-B from Wenzel et al. (1966).

4-X-67; 3 males ex 3 *Vampyrops helleri*, 12 males and 9 females ex *Glossophaga soricina*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 10-VII—27-IX-67; 2 females, same host, Río Orinoco, Tamatama, 135 m, 27-IV—7-V-67; 1 male, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I-67; 1 male and 1 female, same host, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 24-VII—27-IX-67; 1 female, same host, 28 km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-X-67; 1 female, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 7-IX-67.

TRUJILLO: 1 female ex *Glossophaga soricina*, 2 males ex *Glossophaga longirostris*, 25 km NNW Valera, Agua Santa, Valera, 90-164 m, 3-IX-65; 1 male, same host, 1 male and 1 female ex *Glossophaga soricina*, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 19-23-VIII-65; 3 males and 1 female ex *Glossophaga longirostris*, 26 km N Valera, Quebrada Seca, Valera, 131 m, 21-X-65.

YARACUY: 3 males and 4 females ex *Glossophaga soricina*, 20 km NW San Felipe, Minas de Aroa, 395-400 m, 12-21-XII-67.

YARACUY/CARABOBO: 1 male ex *Glossophaga soricina*, 10 km NW Urama, Urama, 25 m, 6-III-66.

ZULIA: 2 males ex *Glossophaga longirostris*, 34 km NNE Paraguaipoa, nr. Cojoro, 15 m, 24-26-VI-68; 1 male, same host, 35 km NNE Paraguaipoa, nr. Cojoro, 15 m, 1-VII-68; 1 male and 1 female, same host, 36 km NNE Paraguaipoa, nr. Cojoro, 15 m, 25-29-VI-68; 2 males ex *Glossophaga soricina*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III-68; 2 males and 2 females, same host, 21 km SW Machiques, Kasmera, 270 m, 17-20-IV-68; 2 males and 2 females, same host, 19 km WSW Machiques, Novito, 1,135 m, 4-V-68.

OTHER VENEZUELAN MATERIAL EXAMINED

CARABOBO: 28 males and 6 females (host unknown), Yuma, 9-IV-49, F. Fernando Y.; 1 male and 1 female, same data, but ex *Myotis* sp. [1], 2-VII-55.

HOST ASSOCIATIONS

Of 354 specimens of *Trichobius dugesii* collected by the survey teams, 346 (97.7 percent) were from species of *Glossophaga* as follows: 157 (44.3 percent) ex 99 *G. longirostris* and 187 (53 percent) ex 126 *G. soricina*. The remaining records probably represent temporary associations in common roosting sites of the hosts, contaminants, or errors of association.

REMARKS

Central American specimens of *T. dugesii* are usually very easy to separate from *T. joblingi* and related species, because of the normally very short scutal setae of the antescutellar row. In many Venezuelan specimens these setae are longer or are a mixture of longer and very short setae, and the short discal mesonotal setae appear to be more numerous. This makes identification of liquid-preserved specimens very difficult.

Trichobius propinquus, new species
(Fig. 22B, 26G)

Though noticeably larger, *Trichobius propinquus*, n. sp. is otherwise virtually identical to *Trichobius dugesii* in most characters of both male and female. However, it does differ markedly in that the prescutum has more numerous (and longer) long setae, most of them macrosetae; these long setae are especially noticeable in the females, which have 54-58, as opposed to 42-44 in *dugesii*, and in the males there are 42-46, as opposed to 34-36 in *dugesii*. Most of these long setae are nearly as long as or longer than the median suture in female *propinquus;* in the males, this is true only of the setae in the anterior angles and of some along the sides, the more median ones being noticeably shorter in the males. Thus, in mesonotal chaetotaxy the males of *propinquus* somewhat resemble females of *dugesii*. In *dugesii* females only a few of the longest prescutal setae are as long as the median suture. As in *propinquus*, the longer prescutal setae of *dugesii* males become shorter medially than those on sides and in anterior angles, and, with the exception of one or two in the extreme anterolateral angles, none are as long as the median suture.

DESCRIPTION

Head. Eyes rather small, with 10 facets, their length shorter than width of each lateravertex. Lateravertices with 5 long, strong and 1 short setae. Occipital lobes with 8 strong and 2 short setae along posterior margin, several of the setae longer than occipital plates are wide. Palpi subovate, their inner anterior margin oblique; strongly setose on the underside, on more than apical half. Theca longer than broad.

Thorax. Thorax broad, anterior margin slightly projecting at middle and feebly emarginate at midline; median longitudinal suture present on about anterior half or slightly less; transverse suture distinctly angulate. Prescutum: female with + 54-58 very long setae (mostly macrosetae) anteriorly and on sides, a few of those near the short discals slightly shorter, most of them longer than the median suture; male with 42-46 long setae, these largely restricted

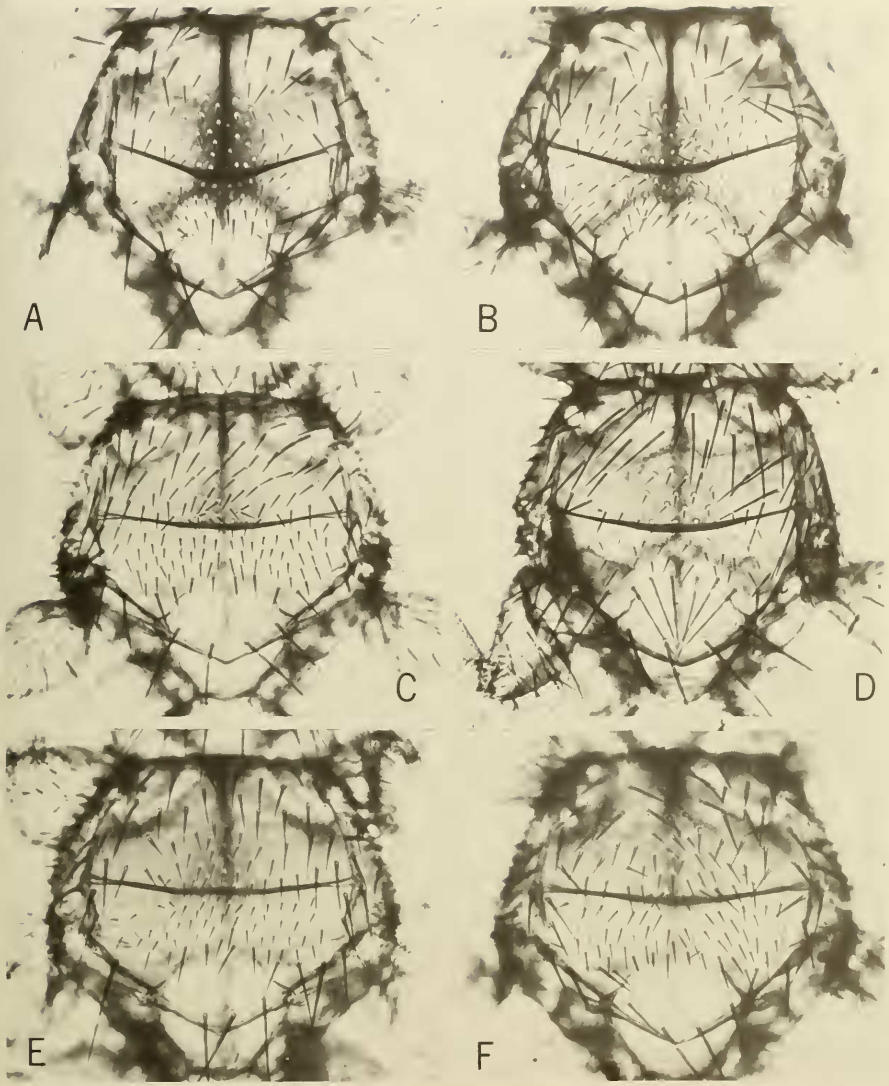

Fig. 24. Thorax, dorsal view, of species of *Trichobius dugesii* group: A, *Trichobius angulatus*, new species, male (SVP 8571); B, *Trichobius assimilis*, new species (female allotype); C, *Trichobius handleyi*, new species, female (SVP 23216); D, *Trichobius tiptoni*, new species, female (SVP 33163); E, male, and F, female, *Trichobius dugesioides* Wenzel.

to anterior angles and sides, those on each side of median suture and next to the short discal seta, distinctly shorter, not as long as suture; median discal area with 22-25 very short, very fine setae. Scutum with ± 60 very short, fine setae which, like those of the prescutum, can hardly be seen in alcohol-preserved specimens; antescutellar row consisting of 8-10 setae, mostly about twice as long as the short discals, but still very short, and with a long macrosetae on each end or row; 4 macrosetae along each lateral margin. Four scutellar setae very long, about as long as or longer than scutellum is wide. Mesosternum not strongly produced, sides strongly oblique; anterior margin truncate or very feebly indented. Metasternal lobe broad but very short, scarcely distinguishable, translucent.

Legs. Generally clothed with very fine, short setae; profemora with numerous long setae along upper surfaces, those along midlength conspicuously longer; midfemora with long setae on upper surface on apical half; hindfemora with long setae on upper surface beginning at about basal fourth; tibiae with very fine, short setae, those of the hind tibiae somewhat longer.

Abdomen. Lateral lobes of tergum 1+2 each with ± 25 setae, about half of them very strong, of varying lengths, most others short, especially along posterolateral margin. Sternum 2 rather evenly setose without conspicuously longer setae laterally. FEMALE. Lateral abdominal connexivum with minute setae, these becoming somewhat longer ventrally, without a conspicuous cluster of strong setae behind tergum 1+2, but with a few that are slightly longer and heavier. Tergum 7 with 2 pairs of short setae in tandem; the anterior pair slightly longer and more widely separated. Supra-anal plate with 4 slender macrosetae and, on each lateral margin, a seta that is about ½ as long. Seventh sternites oval, rather oblique, with 15-17 setae of varying lengths, the anterior 5-6 mostly rather short, others of intermediate length, 3-4 rather long macrosetae. MALE. Sternum 6 present; sternum 7+8 with 5 setae on each side, 2 of these conspicuously longer than the others; each side of tergum 9 with about 10 setae, mostly macrosetae, the apical ones shorter than the anterior ones. Postgonites asymmetrical, twisted to the left, appearing almost straight below in lateral profile (Fig. 26G).

MEASUREMENTS

	Males	Females
BL	1.46-1.65	1.53-1.83
TL	0.54-0.57	0.53-0.68
WL	1.39-1.70	1.36-1.73
WW	0.68-0.75	0.66-0.80

TYPE DATA: Male holotype ex *Anoura geoffroyi* (SVP 20038), Venezuela, Falcón, 14 km ENE Mirimire, nr. La Pastora, 60 m, 23-XI-67 and female allotype, same host (SVP 14985), same locality data but 21-XI-67.

PARATYPES—VENEZUELA. BOLÍVAR: 1 male ex *Anoura geoffroyi*, 85 km SSE El Dorado, Km 125, 1,032 m, 19-V-66.

CARABOBO: 1 female ex *Anoura geoffroyi*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 28-XI-67.

FALCÓN: 6 males and 3 females, same host and locality data as holotype except for 60-122 m, 11-23-XI-67; 5 males, 3 females, and 1 sex undet. ex *Anoura geoffroyi*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-XI—1-XII-67.

SUCRE: 1 male ex *Anoura* sp. A, 26 km ESE Carúpano, Manacal, 366 m, 19-VII-67.

ZULIA: 2 males ex *Anoura* sp. A, 19 km WSW Machiques, Novito, 1,135 m, 2-V-68.

OTHER MATERIAL EXAMINED

TRINIDAD: 1 male (FMNH) ex *Anoura geoffroyi*, Mt. Tamana, Tamana Cave, 11-XI-54, C. C. Sanborn (Field Museum Trinidad Zoological Field Trip) and 1 male (FMNH), same locality but 20-X-57, T. H. G. Aitken (Trinidad Virus Laboratory).

HOST ASSOCIATIONS

Of 25 specimens of *Trichobius propinquus* collected by the survey teams, 22 (88 percent) were from 14 *Anoura geoffroyi* and 3 (12 percent) ex 2 *Anoura* sp. A.

Trichobius joblingi Wenzel
(Fig. 4B, 22D, 25E)

Trichobius joblingi Wenzel, 1966:481, Fig. 68E, 70

Trichobius blandus, authors (part), not Curran

Trichobius dugesii, authors (part), not Townsend

VENEZUELAN SURVEY RECORDS (1,383 males, 1,062 females, 22 sex undet.)

This species occurs throughout Central and South America, with its characteristic host—the ubiquitous *Carollia perspicillata*. It was taken so commonly at so many collecting sites, that enumeration of the many separate collections would serve no purpose. To briefly summarize, the survey teams collected this fly at 97 localities

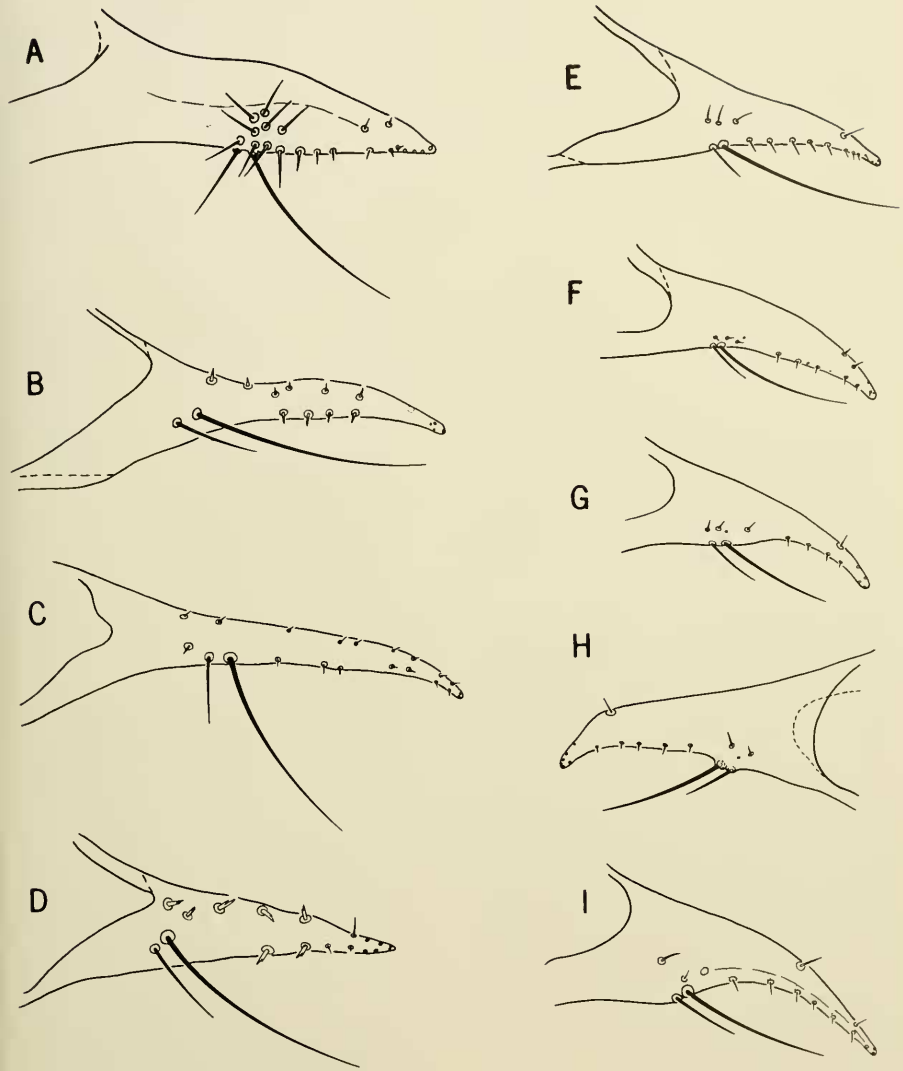

Fig. 25. Male postgonites of species of *Trichobius dugesii* group: A, *Trichobius parasiticus* Gervais; B, *Trichobius diphyllae* Wenzel; C, *Trichobius furmani* Wenzel; D, *Trichobius dugesioides* Wenzel; E, *Trichobius joblingi* Wenzel; F, *Trichobius macrophylli* Wenzel; G-H. *Trichobius dugesii* Townsend; I. *Trichobius urodermae* Wenzel. From Wenzel et al. (1966).

in 14 states, as follows: Apure (4 localities, 24-76 m); Barinas (3 localities, 611-1,070 m); Bolívar (15 localities, 50-1,042 m); Carabobo (3 localities, 25-1,537 m); Dto. Federal (2 localities, 380-1,524 m); Falcón (9 localities, 2-1,260 m); Guárico (4 localities, 100-630 m); Miranda (7 localities, 1-1,160 m); Monagas (3 localities, 854-1,320 m); Sucre (5 localities, 2-380 m); T. F. Amazonas (15 localities, 114-195 m); Trujillo (7 localities, 23-164 m); Yaracuy (2 localities, 25-100 m); Zulia (13 localities, 24-270 m). Many specimens of *Carollia perspicillata* were not examined for parasites, or even more localities would be reported.

OTHER VENEZUELAN MATERIAL EXAMINED

ARAGUA: 1 female ex *"Enchisthenes harti"* (= *A. hartii*) [1], Rancho Grande Biol. Station, 29-VIII-62, J. V. Scorza, C. and A. J. Machado; 3 sex undet. ex *Carollia perspicillata*, same locality data except for 30-III-60, C. O. Handley, Jr.

BOLÍVAR: 6 males and 1 female ex 1 *Carollia p. perspicillata*, 38 km S El Dorado, 30-VIII-62, J. Ojasti.

CARABOBO: 4 males and 3 females, host unknown, Borburata, 3-VI-47, F. Fernandez Y.

MONAGAS: 9 males and 6 females ex *Carollia p. perspicillata*, Guacharo Cave, 900 m, 16-VIII-62, J. Ojasti.

HOST ASSOCIATIONS

Of 2,467 specimens of *Trichobius joblingi* collected by the survey teams, 2,113 (85 percent) were from 889 *Carollia perspicillata*, 242 (9.8 percent) ex 60 *Phyllostomus elongatus*, 36 (1.46 percent) ex 21 *Carollia brevicauda* (taken between 135-1,524 m), 15 (0.6 percent) ex 10 *Sturnira lilium*, 11 (0.4 percent) ex 11 Carollia sp., 3 (.01 percent) ex 2 *Carollia castanea*, and the remaining 47 (1.9 percent) ex 34 bats of the following 16 species: *Anoura geoffroyi*, *Artibeus fuliginosus*, *Artibeus jamaicensis*, *Artibeus lituratus*, *Desmodus rotundus*, *Glossophaga soricina*, *Macrophyllum macrophyllum*, *Micronycteris minuta*, *Micronycteris nicefori*, *Noctilio leporinus*, *Phyllostomus hastatus*, *Pteronotus parnellii*, *Rhinophylla pumilio*, *Sturnira erythromos*, *Sturnira tildae*, and *Trachops cirrhosus*.

It is clear that, as in Panama, the characteristic host of *T. joblingi* is the abundant *C. perspicillata*. Except for the records from *P. elongatus*, most others probably represent transitory transfers through roosting sites or are contaminants resulting from collecting associations. *Phyllostomus elongatus*, as will be noted elsewhere, appears to be a "facultative" host for a number of species which normally parasitize other hosts.

Trichobius persimilis, new species
(Fig. 22C)

DESCRIPTION

Almost identical to *Trichobius joblingi* and the description (Wenzel, 1966:481) of that species applies equally well except as follows: *Thorax*. Transverse mesonotal suture generally slightly more angulate than in *joblingi*. *Abdomen*. FEMALE. Without a cluster of 3-5 setae on each side behind lateral lobes of tergum 1 + 2 that are distinctly heavier and longer than other connexival setae (present in *joblingi*). MALE. Sternum 6 absent (present in *joblingi*). Postgonites as in *joblingi*.

MEASUREMENTS

	Males	Females
BL	1.26-1.64	1.44-1.79
TL	0.51-0.57	0.58-0.66
WL	1.35-1.42	1.36-1.77
WW	0.62-0.72	0.61-0.79

TYPE DATA: Male holotype ex *Carollia brevicauda* (SVP 32817) and female allotype, same host (SVP 32815), Venezuela, Carabobo, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 28-29-XII-67.

PARATYPES—VENEZUELA. APURE: 1 male ex *Carollia brevicauda*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 22-I-68. BARINAS: 1 female ex *Carollia perspicillata*, 16 males and 6 females ex *Carollia brevicauda*, Altamira, 794 m, 14-XII-67—10-I-68; 2 males and 1 sex undet., same host, 1 km SW Altamira, Altamira, 794 m, 14-XII-67; 13 males and 13 females, same host, 2 km SW Altamira, Altamira, 609-620 m, 27-XII-67—3-I-68; 4 males and 5 females, same host, 5 km SW Altamira, Altamira, 794 m, 13-XII-67; 1 male, same host, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67. BOLÍVAR: 1 male and 3 females ex *Carollia perspicillata*, 20 km W La Paragua, Hato San José, 306 m, 6-III-67; 1 female, same host, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 30-IV-68; 3 females ex 2 *Phyllostomus elongatus*, 25 km SE El Manteco, Los Patos, 350 m, 5-IV-66. CARABOBO: 2 males ex *Carollia perspicillata*, 31 males, 14 females, and 1 sex undet. ex *Carollia brevicauda*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 26-30-XI-67; 1 male, same host, 3 km SW Montalbán, Hda. La Canada, Montalbán, 618 m, 22-XI-67; 3 males and 2 females, same host, 3 km W Montalbán, La Leonera, Montalbán, 900 m, 22-23-XI-67; 3 males, same host, 9 km NE Montalbán,

Cumbre Canoabo, Montalbán, 752-1,245 m, 1-XI-67. Dto. Federal: 1 female ex 1 *Vampyrops umbratus*, 12 males and 5 females ex *Carollia brevicauda*, 4 km NNW Caracas, Los Venados, 1,400-1,559 m, 21-VII—13-VIII-65; 9 males and 6 females, same host, 1 female ex 1 *Chiroderma salvini*, 5 km NW Caracas, nr. Clavelitos, Boca Tigre Valley, 1,394 m, 27-VIII-65; 1 female, same host, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 380 m, 21-VIII-66. Falcón: 1 male ex *Carollia brevicauda*, 84 km NW Carora, Cerro Socopo, 1,260 m, 17-V-68. Miranda: 1 male ex 1 *Sturnira ludovici*, 24 males and 7 females ex *Carollia brevicauda*, 5 km NNW Guarenas, Curupao, 1,160 m, 5-X—23-XII-66; 1 male and 2 females, same host, 13 km SE Caracas, nr. El Encantado, El Encantado, 570 m, 14-I-68. Monagas: 2 males and 4 females ex *Carollia brevicauda*, 3 km NW Caripe, nr. San Agustín, 1,275 m, 11-VII-67; 1 male and 1 female, same host, 5 km NW Caripe, San Agustín, 1,160 m, 26-VI-67. Zulia: 1 female ex 1 *Carollia castanea*, 21 km SW Machiques, Kasmera, 270 m, 22-IV-68; 1 female ex 1 *Phyllostomus discolor*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III-68.

Host Associations

Of 211 specimens of *Trichobius persimilis* that were collected by the survey teams, 191 (90.5 percent) were from 126 *Carollia brevicauda*, 8 (3.8 percent) ex 4 *Carollia perspicillata* (at elevations above 306 meters), 6 (2.84 percent) ex 2 *Phyllostomus elongatus*, and the remaining 6 specimens from 5 bats of 5 different species.

Remarks

Were it not for the nearly invariable association of these flies with *Carollia brevicauda*, one would be tempted to regard them as variants of *T. joblingi*. The presence or absence of the sixth sternum may be difficult to determine in identifying this species and *T. joblingi*. It is very small and often very inconspicuous in *T. joblingi*.

Interestingly, the host association and altitudinal distribution of this fly is paralleled by that of *Speiseria peytoni*, n. sp. (q.v.) which occurs on *C.* brevicauda, while *S. ambigua* occurs on *C. perspicillata*.

Trichobius persimilis was so rarely taken from *C. perspicillata*, and *T. joblingi* so rarely from *C. brevicauda*, that one may question the records; but I believe that at least some, if not most, are valid.

Trichobius macrophylli Wenzel
(Fig. 22E, 25F)

Trichobius macrophylli Wenzel, 1966:486, Fig. 68F, 69B

Venezuelan Survey Records (58 males, 36 females)

APURE: 4 males and 6 females ex *Macrophyllum macrophyllum*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 6-XII-65.

BOLÍVAR: 2 males ex *Macrophyllum macrophyllum*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 10-VI-66; 1 male, same host, 50 km SE El Manteco, Río Supamo, 150 m, 11-IV-66.

GUÁRICO: 12 males and 8 females ex *Macrophyllum macrophyllum*, 35 km SSW San Juan de los Morros, Hto. Las Palmitas, 181 m, 7-I-68.

T. F. AMAZONAS: 2 males and 3 females ex *Macrophyllum macrophyllum*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 10-II-67; 13 males and 8 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-10-IV-67.

ZULIA: 22 males and 11 females ex *Macrophyllum macrophyllum*, 56 km WNW Encontrados, El Rosario, 76 m, 10-28-III-68; 2 males, same host, 61 km WNW Encontrados, El Rosario, 52 m, 28-III-68.

Other Venezuelan Material Examined

Twenty-one males and 16 females, "Sobre Chiroptera," Lago de Valencia, 25-VIII-48, J. Racenis.

Trichobius handleyi, new species
(Fig. 24C, 26E)

Distinct from other species of the *dugesii* complex in the following combination of characters: the small eyes, densely setose palpi, the extensive area of prescutal microtrichia (visible only in slide preparations), the densely setose mesonotum with long antescutellar setae, the very short metasternal lobe, and the symmetrical (not twisted) male postgonites.

Also, the occipital lobes in most specimens have 8-10 rather than the usual 7 strong setae. It differs from *T. macrophylli*, which also have a very short metasternal lobe, similar palpi, and mesonotal chaetotaxy, in having small eyes (conspicuous, with large facets, in *macrophylli*); a trapezoidal tergum 7 with 2 pairs of setae in tandem (very small, transverse, with setae in a transverse row in *macrophylli*); sternum 6 present in the male (absent in *macrophylli*); and symmetrical (nontwisted) male postgonites.

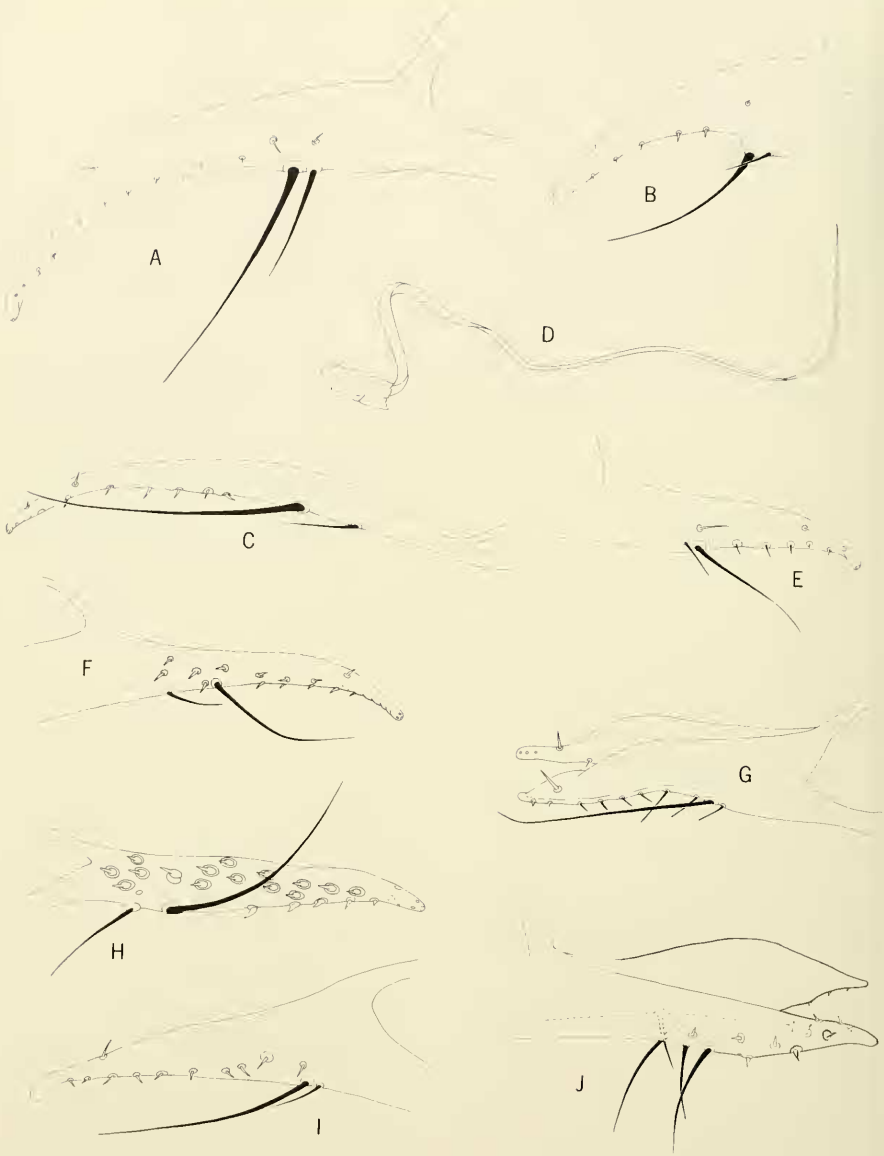

Fig. 26. Male postgonites (except D) of species of *Trichobius dugesii* group: A, *Trichobius assimilis,* new species (SVP 22086); B, *Trichobius angulatus,* new species (holotype); C, right postgonite and D. aedeagus; *Trichobius flagellatus,* new species (SVP 16442); E, *Trichobius handleyi,* new species (SVP 23216); F, *Trichobius ethophallus,* new species (SVP 5503); G, *Trichobius propinquus,* new species (SVP 20274); H, *Trichobius tuttlei,* new species (holotype); I, *Trichobius tiptoni,* new species (SVP 33073); J. *Trichobius diaemi,* new species (SVP 26861). All drawn to same scale.

The only other species of the *dugesii* group with such an extensive area of microtrichia is *T. furmani*, a member of the *parasiticus* complex.

Description

Eyes very small with 10 facets, their length a little more than half width of each laterovertex and less than greatest length of each occipital lobe. Each laterovertex with 5 strong and 1 short setae; occipital lobes each with 8-10 strong setae and 2 short ones along posterior margin. Palpi subovate, apices rounded, apical macroseta without a large gap between it and the next most mesal seta, the interval between them approximately equal to that between other distal setae.

Thorax. Thorax broad, somewhat depressed; anterior margin slightly produced at middle, with a slight emargination at midline; median suture present on a little less than apical half of prescutum, transverse suture very feebly bowed or angulate. Prescutum with ± 50 longer setae and 50-55 shorter ones, but these, though denser at middle, become gradually longer anteriorly and laterally, the longest setae along anterior margin and sides. Scutum with approximately 60 short discal setae similar to those of prescutum, these slightly longer laterally, and a row of about 8 long antescutellar setae which extend posteriorly about half length of scutellum, mostly twice as long as discal setae or a little longer; lateral margins of prescutum each with 4 macrosetae. Microtrichia of prescutum covering a broadly triangular area which begins near basolateral angle, widens out anteriorly along anterior margin to include the anterior angles, and extends medially slightly beyond the second setae from the median suture; microtrichia of scutum along margin of notopleural suture extending inwardly to enclose marginal macrosetae, and along posterior margin to beyond second seta from margin. Mesosternum not strongly produced, lateral margins strongly oblique, anterior margin feebly emarginate. Metasternal lobe very short, translucent, very difficult to see in slide preparations.

Wings. Without distinctive characters, third crossvein slightly nearer first than second. *Legs.* Outer surface of profemora clothed with short setae which become slightly longer distally; upper surface with about 10 macrosetae and 7 or 8 other strong setae on about apical ⅔; midfemora with similar setation but with fewer long setae; hindfemora with about 8 macrosetae along upper edge, beginning at about basal fourth, and a dozen or more other longer setae on lateral surface, these becoming conspicuously longer distally.

Abdomen. Lateral lobes of tergum 1+2 with ± 27 setae, about 12 of them macrosetae, the others shorter, especially along posteroventral margin. Sternum 2 rather uniformly setose, posterior margin deeply emarginate. Female. Tergum 7 small, much narrower than the supra-anal plate, trapezoidal with 2 pairs of very short setae located in the angles in tandem; tergum apparently connected by a narrow sclerotized band to the very short supra-anal plate, which has 4 macrosetae and, on each lateral margin, a shorter seta which is of about same length as the anterior pair of setae on tergum 7. Lateral connexivum with very short, minute setae excepting sometimes 2 or 3 slightly stronger and longer ones that are posterior and somewhat ventral to posterior edge of lateral lobe of tergum 1+2, and a few longer ones at apex of venter. Seventh sternites small, oval, with ± 15 setae, of which about half are macrosetae, the others shorter to short along basal half of sternite. Male. Sternum 5 well developed, the posterior margin slightly emarginate, the discal setae of about the same length as the connexivals; those along posterior margin distinctly longer, becoming even slightly longer laterally. Scutum 6 present, threadlike. Sternum 7+8 with 11 setae; 2 of the more dorsal ones are macrosetae, the rest quite small; tergum 9 with about 16 setae on each side, 2 or 3 of the more dorsal ones macrosetae, the others varying from shorter to short, mostly short.

Postgonites (Fig. 26E) with ventral margins nearly straight, their apices bent slightly downward, with ventral and lateral microsetae and distal sensillae; macroseta of each inserted just anterior to midlength, the accessory seta inserted immediately anterior to macroseta.

Measurements

	Males	Females
BL	1.25-1.45	1.32-1.60
TL	0.45-0.53	0.50-0.54
WL	1.10-1.17	1.21-1.34
WW	0.54-0.60	0.51-0.65

Type Data: Male holotype and female allotype ex *Micronycteris minuta* (SVP 23223), Venezuela, Zulia, 33 km NW La Paz, nr. Cerro Azul, 75 m, 7-VI-68.

Paratypes—VENEZUELA. Apure: 2 males and 1 female ex *Micronycteris minuta*, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 14-XII-65; 2 females, same host, 0-38 km NNW Pto. Páez, Río Cinaruco, Pto.

Páez, 76 m, 13-I-66. BOLÍVAR: 3 males ex *Micronycteris minuta*, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66; 1 male ex 1 *Phyllostomus elongatus*, 50 km SE El Manteco, Río Supamo, 150 m, 30-III-66; GUÁRICO: 1 female ex *Micronycteris minuta*, 14 km SE Calabozo, nr. Río Orituco, Est. Biol. de los Llanos, 100 m, 22-VIII-68. MIRANDA: 5 males ex *Micronycteris minuta*, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 16-17-XI-66. MONAGAS: 3 females ex *Micronycteris minuta*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68. SUCRE: 2 males ex *Micronycteris minuta*, 21 km E Cumaná, 1 m, 22-XII-66. T. F. AMAZONAS: 1 female ex *Micronycteris minuta*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 18-VII-67. TRUJILLO: 4 females ex *Micronycteris minuta*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 3-IX—7-X-65. ZULIA: 43 males and 36 females, same host and locality data as for holotype but 75-80 m, 7-15-VI-68; 2 males and 1 female ex *Micronycteris minuta*, 35 km NW La Paz, nr. Cerro Azul, 80 m, 11-VI-68.

Host Associations

Of 109 specimens (58 males and 51 females) of *Trichobius handleyi* collected by the survey teams, 108 (99.1 percent) were from 25 *Micronycteris minuta*.

Remarks

This species is named for my friend and colleague, Dr. Charles O. Handley, Jr., not only to honor his vital role in planning and executing the Smithsonian Venezuelan Project, but also to show appreciation for his personal assistance in many aspects of my studies.

Trichobius urodermae Wenzel
(Fig. 22F, 25I)

Trichobius urodermae Wenzel, 1966:476, Fig. 66B, 68I

Venezuelan Survey Records (17 males, 12 females)

T. F. AMAZONAS: 1 female ex *Uroderma bilobatum*, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 2-II-67; 2 males and 1 female, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 6-I—3-II-67; 2 males and 3 females, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 8-X-67.

TRUJILLO: 2 males and 1 female ex *Uroderma bilobatum*, 56 km WNW Valera, La Ceiba, 29 m, 27-X-65; 1 female, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 7-IX-65.

ZULIA: 1 male ex 1 *Artibeus literatus*, 1 male and 2 females ex *Uroderma bilobatum*, 63 km WNW Encontrados, La Rinconada, El Rosario, 125 m, 27-28-II-68; 1 male, same host, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 18-III-68; 1 male, same host, 48 km WNW Encontrados, El Rosario, 54 m, 27-II-68; 7 males and 3 females, same host, 42 km WNW Encontrados, El Rosario, 24 m, 4-5-III-68.

Trichobius tiptoni, new species
(Fig. 24D, 26I)

Superficially resembling *Trichobius urodermae* Wenzel but differing in many respects. Setae in general longer than in that species, including the long prescutals and those of antescutellar row, as well as of sternum 2, and the female ventral connexival setae, these mostly no shorter than the shorter basal setae of sternum 2 in *tiptoni*, but only half as long in *urodermae*. Median prescutal setae sparse, 15-20 in number, as opposed to 45-50 in *urodermae*. Eyes small, shorter than greatest width of a laterovertex (coarsely faceted and as long as or longer than width of a laterovertex in *urodermae*). Female tergum 7 transverse, the 2 pairs of setae nearly in a row (trapezoidal with the setae distinctly in tandem in *urodermae*). Seventh sternites of female with only ± 12 setae, as opposed to ± 17 in *urodermae*. Each side of male sternum 7+8 with ± 8-10 setae, mostly macrosetae, and 1 short dorsomedian seta as opposed to 3-5 setae, 2-3 of them macrosetae and 1 short dorso-median seta in *urodermae*. Male postgonites more slender and gradually narrowed distally, the ventral macroseta inserted near midlength (thicker basally, rather suddenly narrowed and curved, the macrosetae inserted farther basad in *urodermae*).

Description

Head. Eyes rather small, with 10 facets, distinctly shorter than greatest width of each laterovertex, these with 5 long, strong, and 1 minute setae; occipital lobes with 7 very strong setae, and 2 short setae below posterior margin. Palpi feebly pointed, their ventral surface setose on a little more than basal half. Theca approximately as broad as long.

Thorax. Anterior margin slightly projecting along middle and slightly emarginate at midline; median suture present on apical half or a little less, transverse suture broadly arcuate or slightly angulate, the middle portion less distinct. Prescutum with 38-42 long setae, most of them

long macrosetae, and 15-20 very short median discal setae; those long setae situated anteriorly along midline somewhat shorter in males than in females. Scutum with about 32 discal setae of which several on each side are longer than the median ones, these very short; antescutellar row consisting of 8-10 macrosetae; 4 macrosetae along each lateral margin. Scutellar setae longer than width of scutellum. Mesosternum with strongly oblique lateral margins, anterior margin rather broad, feebly emarginate. Metasternal lobe large, translucent, strongly dorsally reflexed, extending almost halfway to metepimeron.

Wings. Radius and 3rd and 4th longitudinal veins with 2, 3, and 4-5 conspicuous macrosetae, respectively. *Legs.* Outer surface of profemora with short setae which become conspicuously longer apically; dorsal margin with numerous long, strong setae beginning a little before midlength, becoming somewhat shorter distally. Chaetotaxy of midfemora similar. Hindfemora with numerous (20+) macrosetae along dorsal surface, beginning at about basal third.

Abdomen. Lateral lobes of tergum 1+2 with 20-22 setae, most of them strong macrosetae, a few shorter ones along posterolateral margin. Setae of sternum 2 rather uniform throughout. Female. Lateral connexivum with very short setae, these becoming longer ventrally, the ventral ones becoming longer apically. Tergum 7 very short, transverse, with 2 pairs of short setae in tandem, the anterior pair slightly longer and more widely separated. Supra-anal plate very short with 4 distal macrosetae and, on each side, an additional strong seta that is about half as long as distal macrosetae. Seventh sternites oval, with ± 12 setae, those on inner half conspicuously shorter than those on outer half, several of these being macrosetae, one of them conspicuously longer than the others. Male. Sternum 5 rather long, slightly narrowed at middle, setae more or less uniform except that those along distal margin become conspicuously longer toward sides. Sternum 6 almost threadlike. Each side of sternum 7+8 with 8-10 strong setae, most of them macrosetae, and 1-2 very short dorsomedial setae; each side of tergum 9 with ± 13 strong setae, mostly macrosetae arranged in 2 rows. Postgonites twisted to the left, in lateral profile appearing to have apices ventrally curved; the ventral margins with a row of fine setae.

Measurements

	Males	Females
BL	1.30-1.60	1.39-2.00
TL	0.53-0.60	0.56-0.68
WL	1.39-1.63	1.58-1.80
WW	0.62-0.74	0.63-0.82

Type Data: Male holotype and female allotype ex *Anoura caudifer* (SVP 34187), Venezuela, Barinas, 2 km SW Altamira, Altamira, 609 m, 4-I-68. Paratype—Barinas: 14 males, 11 females and 1 sex undet. ex *Anoura caudifer*, 1 male ex 1 *Sturnira ludovici*, 1 male ex 1 *Desmodus rotundus*, same locality as holotype but 609-620 m, 26-XII-67—4-I-68; 1 female ex 1 *Carollia perspicillata*, 4 males and 8 females ex *Anoura caudifer*, Altamira, 600-794-m, 13-20-XII-67; 2 males, same host, 7 km NNE Altamira, Altamira, 1,070 m, 26-XII-67. Bolívar: 7 males and 7 females ex *Anoura caudifer*, 85 km SSE El Dorado, km 125, 826-1,165 m, 10-23-V-66. Carabobo: 4 males ex *Anoura caudifer*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 30-XI—1-XII-67. Dto. Federal: 1 male ex *Anoura caudifer*, 4 km NNW Caracas, Los Venados, 1,498 m, 23-VII-65. Miranda: 1 male ex *Anoura caudifer*, Birongo, 60 m, 22-I-68; 4 males and 2 females, same host, 5 km NNW Guarenas, Curupao, 1,140-1,180 m, 13-X-66; 2 males, same host, 16 km SSE Caracas, San Andres, 950 m, 30-XII-65. Yaracuy: 2 males and 2 females ex *Anoura caudifer*, 1 female ex 1 *Vampyrops helleri*, 20 km NW San Felipe, Minas de Aroa, 400 m, 6-21-XII-67.

Host Associations

Of 77 specimens (44 males and 33 females) of *Trichobius tiptoni* collected by the survey teams, 73 (94.8 percent) were from 40 *Anoura caudifer*, the other 4 ex 4 different species of bats, some of them certainly contaminants, others perhaps transitory transfers.

Remarks

It should be noted that in some specimens the innermost 3 setae along the posterior margin of each occipital lobe are arranged on a distinctive slightly elevated flap reminiscent of the posterior flaps in *Exastinion*, which are also parasites of *Anoura*. This cannot be detected in most slide preparations but can be seen in liquid-preserved specimens, if the head is tilted slightly upward.

This species is named for my friend and colleague, Dr. Vernon J. Tipton, whose energies and dedication, together with his understanding of goals and logistics, have played a major role in the successful execution of the Smithsonian Venezuelan Project.

Trichobius angulatus, new species
(Fig. 24A, 26B)

Females of *Trichobius angulatus* n. sp. are virtually indistinguishable from those of *T. intermedius* Peterson and Hurka (1975:1049), which is known from West Indies and Central America (Mexico to El Salvador), chiefly on various races of *Artibeus jamaicensis*; but the setation of the undersides of the palpi is slightly more extensive (only on about basal half in that species), and the seta on or near each lateral margin of the supra-anal plate is very short, of about same length as shorter setae of tergum 7. In *intermedius* this seta is generally noticeably longer, though not as long or as strong as it is in *T. assimilis* n. sp. The males, however, may be easily separated from those of *intermedius* by their more slender, strongly curved postgonites (Fig. 26B).

DESCRIPTION

Head. Eyes with 11 large facets. Laterovertices each with 5 strong setae; occipital lobes each with 7 very strong setae (mostly macrosetae) and 2 very short setae along posterior margin. Palpi with apical margins oblique and emarginate between the long distal macroseta and the next most mesal seta; undersides setose on about apical ⅔ or ¾.

Thorax. Anterior margin subtruncate, usually feebly broadly arcuate, and slightly emarginate at midline. Median suture strong on anterior half or slightly more; transverse suture strongly angulate, less distinct along middle. Prescutum with a median discal area of approximately 41-45 short setae in the male, and 34-35 in the female, and 28-34 long preseutal setae anteriorly and along sides. Scutum with from 39-48 short setae and a row of 8-10 antescutellars, most of these 2-3 times as long as the discal setae, and a long macroseta at each end of row. Scutellar setae very long, longer than scutellum is wide. Mesosternum with strongly oblique lateral margins, anterior margin slightly emarginate. Metasternal lobe broad, translucent, slightly bent upwardly.

Wings. Without distinctive characters. *Legs.* as in *T. intermedius* Peterson and Hurka.

Abdomen. Lateral lobes of tergum 1+2 with from 11-15 setae, a few of them, especially ventrally, small, most of them very short, and most of them macrosetae. Sternum 2 with rather uniform setae excepting that they become longer laterally and especially around the lateral angles where there is a cluster of stronger, longer setae. FEMALE. Lateral connexival setae very short, except for a cluster of from 5-8 setae that are conspicuously longer and coarser behind and slightly ventrad to the lateral lobes of tergum 1+2. Tergum 7 very small, either transverse or sometimes trapezoidal, much narrower than the supra-anal plate, with 2 pairs of setae in tandem, the anterior pair farther apart and longer and stronger; supra-anal plate with 4 distal macrosetae and on each lateral margin a very short weak seta only slightly longer than the short setae on tergum 7. Seventh sternites with 10-11 setae each, including several smaller ones basally and at least 3 or 4 macrosetae distally, one of these conspicuously longer than the others. MALE. Sternum 5 well developed, rather evenly setose, most setae of about the same size as the ventral connexival setae, those along middle of apical margin slightly longer, becoming conspicuously longer laterally where several are 2 or 3 times as long as the discal setae. Sternum 6 present. Sternum 7+8 with 4 or 5 setae, two of them conspicuously long macrosetae; tergum 9 with about 10-11 setae on each side, of which the mostly ventral and anterior ones are rather short and several of the lateral ones are conspicuous macrosetae.

MEASUREMENTS

	Males	Females
BL	1.79-1.92	1.96-2.13
TL	0.69-0.71	0.73-0.78
WL	1.58-1.71	1.76-1.86
WW	0.79-0.84	0.81-0.85

TYPE DATA: Male holotype (SVP 8571) and female allotype (SVP 8845) ex *Vampyrops aurarius*, Venezuela, Bolívar, 85 km SSE El Dorado, Km 125, 1,032 m, 20-V-66. PARATYPES—VENEZUELA. BOLÍVAR: 11 males and 8 females, same host and locality data as holotype but 8S9-1,165 m, 23-III—26-V-66. T. F. AMAZONAS: 4 males and 1 sex undet. ex *Vampyrops aurarius*, Caño Culebra, 50 km NNW Esmeralda, Cerro Duida, 700-800 m, 17-19-I-67.

Trichobius assimilis, new species
(Fig. 24B, 26A)

The description of *Trichobius angulatus* applies almost equally well to *T. assimilis*. The most distinctive differences are in the setation of the palpi (setae present on basal half of underside or less, rather than on slightly more than apical half); the strong seta on each side of the female supra-anal plate; and the short and slender, less abruptly curved male postgonites.

Both species are extraordinarily close to *T. intermedius*, which also has a very strongly angulate transverse mesonotal suture and like *assimilis* and *angulatus* appears to be parasitic primarily on *Artibeus jamaicensis*. In *intermedius* the seta on each side of the supra-anal plate is much shorter, and, more importantly, the male postgonites are much heavier and not as strongly curved.

Description

Almost identical to *Trichobius angulatus* in most characters, except as follows: undersides of palpi setose on basal half or less; the prescutum with more numerous short, median-discal setae (40-50 in the males, as many as 60 in 1 female), these generally slightly longer than in *angulatus;* scutum with 39-43 short setae; antescutellar row of setae generally more consistently composed of longer setae (whereas there is often an admixture of longer and shorter ones in *angulatus*). Female. Supra-anal plate with a strong seta on each side, this ⅓ to ½ as long as the distal macrosetae. Seventh sternites with 12-15 setae, mostly stronger and longer than in *angulatus*, about half of them conspicuously longer, stronger macrosetae. Male. Postgonites rather long and slender (Fig. 26A), similar to those of *angulatus*, but not as strongly curved.

Measurements

	Males	Females
BL	1.92-2.15	1.95-2.32
TL	0.68-0.78	0.81-0.87
WL	1.55-1.77	1.82-1.92
WW	0.75-0.86	0.90-0.95

Type Data: Male holotype and female allotype ex *Artibeus* sp. D (SVP 22086), Venezuela, Zulia, 21 km SW Machiques, Kasmera, 270 m, 15-IV-68. Paratypes—VENEZUELA. Bolívar: 3 males and 2 females ex *Artibeus jamaicensis*, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 7-9-V-68; 1 male, same host, 28 km NE Icabarú, Icabarú, 775 m, 28-IV-68; 7 males and 3 females, same host, and 1 male ex 1 *Vampyrops aurarius*, 85 km SSE El Dorado, Km 125, 826-1,032 m, 19-19-V-66. T. F. Amazonas: 3 males and 1 female ex *Artibeus jamaicensis*, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 12-I—2-II-67; 3 males and 1 female, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 10-I—3-II-67; 10 males and 3 females, same host, Cabecera del Caño Culebra, 40 km NNW Esmeralda, 1,140 m, 2-7-II-67. Zulia: 4 males and 4 females, same data as the holotype.

Host Associations

Of 48 specimens (33 males and 15 females) of *Trichobius assimilis* that were collected by the survey teams, 37 (77 percent) were from 21 *Artibeus jamaicensis* and 10 (20.8 percent) from 2 *Artibeus* "sp. D." The single specimen from *Vampyrops aurarius* is probably a contaminant from specimens of *A. jamaicensis* that were apparently collected at the same time.

Trichobius sp.

A male and female from *Micronycteris megalotis* closely resemble *T. joblingi*. The female has a small cluster of coarser setae behind the lateral lobes of tergum 1+2, as in that species, but the setae of tergum 7 resemble those of *dugesii*. The male postgonites are similar to those of *joblingi* but appear to be nearly symmetrical and are not strongly twisted to the left as in *joblingi*. These specimens may represent a distinct species.

Venezuelan Survey Records

T. F. AMAZONAS: 1 male and 1 female ex *Micronycteris megalotis* (SVP 30914), 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 24-IX-67.

Trichobius parasiticus complex

Trichobius dugesioides Wenzel

(Fig. 4C, 24E, F; 25D)

Trichobius dugesioides Wenzel, 1966:488, Fig. 68D, 71

Venezuelan Survey Records (405 males, 342 females, 1 sex undet.)

APURE: 1 male and 2 females ex *Carollia perspicillata*, 2 males ex *Trachops cirrhosus*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 22-31-I-68; 1 male ex 1 *Macrophyllum macrophyllum*, 24 males and 8 females ex *Trachops cirrhosus*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 23-28-XII-65; 4 males and 4 females, same host, 3 females ex 2 *Desmodus rotundus*, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 14-27-XII-65.

BARINAS: 4 males and 1 female ex *Carollia perspicillata*, 2 km SW Altamira, Altamira, 611-620 m, 27-XII-67—4-I-68; 1 male and 1 female, same host, 1 female ex 1 *Carollia brevicauda*, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67; 2 males and 1 female ex *Carollia perspicillata*, Altamira, 794 m, 13-XII-67—9-I-68.

BOLÍVAR: 1 female ex *Carollia perspicillata*, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 2-V-68; 1 male and 2 females, same host, 23 km NE Icabarú, El Pauji, Icabarú, 824 m, 28-29-IV-

68; 1 male and 3 females, same host, 2 males and 3 females ex *Trachops cirrhosus*, 45 km NE Icabarú, Santa Lucia de Surukum, Icabarú, 851 m, 30-IV—2-V-68; 8 males and 2 females, same host, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 14-23-VI-66; 6 females, same host, 20 km W La Paragua, Hato San José, 306 m, 6-III—10-IV-67; 1 female, same host, 5 males ex *Phyllostomus elongatus*, 50 km SE El Manteco, Río Supamo, 30-III—10-IV-66; 1 female, same host, 70 km SSE El Dorado, Piedra Virgen, Km 125, 229 m, 29-V-66; 2 females, same host, 25 km SE El Manteco, Los Patos, 150 m, 5-IV-66.

CARABOBO: 13 males and 14 females ex *Trachops cirrhosus*, 6 km N Urama, 60 m, 17-III-66.

FALCÓN: 2 females ex *Carollia perspicillata*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-30-XI-67; 4 males and 1 female ex 2 *Chiroderma villosum*, 9 males and 12 females ex *Chrotopterus auritus*, 1 male and 1 female ex 2 *Sturnira lilium*, 58 males and 50 females ex *Trachops cirrhosus*, 19 km NW Urama, Km 40, Urama, 25 m, 18-X—3-XI-65.

GUÁRICO: 38 males and 36 females ex *Trachops cirrhosus*, 14 km SE Calabozo, nr. Río Orituco, Est. Biol. de los Llanos, 100 m, 22-VIII-64—22-VIII-68.

T. F. AMAZONAS: 2 males and 1 female ex *Trachops cirrhosus*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 20-II-66; 3 males and 3 females, same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V—2-VI-67; 3 males and 8 females, same host, 14 km SSE Pto. Ayacucho, El Gavilan, Pto. Ayacucho, 135 m, 11-X-67; 4 females, same host, 1 male ex *Carollia perspicillata*, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 7-IX-67; 1 male, same host, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 12-I-67; 5 males, same host, 1 male ex *Chrotopterus auritus*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 10-15-I—9-II-67; 1 male ex *Carollia perspicillata*, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 27-IX-67; 4 males and 5 females ex *Trachops cirrhosus*, 33 km S Pto. Ayacucho, El Raudal, Pto. Ayacucho, 195 m, 20-IX—5-X-67; 1 male ex 1 *Phyllostomus hastatus*, 1 male ex *Phyllostomus elongatus*, Río Orinoco, Tamatama, 135 m, 28-IV—8-V-67; 1 male ex 1 *Tonatia silvicola*, 1 female ex 1 *Phyllostomus discolor*, 1 male ex 1 *Sphaeronycteris toxophyllum*, 100 males and 82 females ex *Trachops cirrhosus*, 5 males and 6 females ex *Carollia perspicillata*, 1 female ex *Phyllostomus elongatus*, 2 males ex *Chrotopterus auritus*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-14-IV-67; 48 males, 46 females and 1 sex undet. ex *Trachops cirrhosus*, 1 male ex *Phyllostomus elongatus*, 13 males and 6 females ex *Chrotopterus auritus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-27-VII-67.

TRUJILLO: 1 male ex *Chrotopterus auritus*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 6-X-65; 2 males ex *Trachops cirrhosus*, 23 km NNW Valera, Río Motatan, Valera, 90 m, 8-X-65; 2 males, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 22-X-65.

YARACUY: 1 male and 3 females ex *Trachops cirrhosus*, 11 km NW Urama, El Central, Urama, 25 m, 15-III-66; 2 females ex *Carollia perspicillata*, 20 km NW San Felipe, Minas de Aroa, 395-400 m, 7-13-XII-67.

YARACUY/CARABOBO: 4 males and 1 female ex *Chrotopterus auritus*, 10 km NW Urama, Urama, 25 m, 17-X-65.

ZULIA: 4 males and 1 female ex 3 *Carollia*, 2 males ex *Carollia perspicillata*, 21 km SW Machiques, Kasmera, 270 m, 15-22-IV-68; 1 female, same host, 14 males and 11 females ex *Trachops cirrhosus*, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 17-18-III-68; 1 male ex *Carollia perspicillata*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III-68; 1 female, same host, 48 km WNW Encontrados, El Rosario, 54 m, 25-II-68; 1 male, same host, 63 km WNW Encontrados, La Rinconada, El Rosario, 125 m, 28-II-68.

Host Associations

Of 747 specimens of *Trichobius dugesioides* collected by the survey teams, 616 (82.5 percent) were from 112 *Trachops cirrhosus*, 49 (6.5 percent) ex 10 *Chrotopterus auritus*, 50 (6.7 percent) ex 40 *Carollia perspicillata*, 11 (1.47 percent) ex 8 *Phyllostomus elongatus*. The remaining 21 were from 10 bats of 10 different species; while many of these undoubtedly represent transitory transfers and perhaps some contamination, the records from *P. elongatus* probably represent facultative parasitization. For a discussion of the occurrence of *dugesioides* on *C. perspicillata* in Panama, see Wenzel et al. (1966:490, 645).

Trichobius tuttlei, new species

(Fig. 23E, 26H)

Females of *tuttlei* are easily separated from similar species by the short transverse tergum 7, which is much narrower than the proctiger, and especially by the possession of only 3 instead of 4 distal macrosetae on the supra-anal plate. Males are distinct from *ethophallus* in

having only 7-9 setae on each side of sternum 7+8 (16-17 in *ethophallus*) and from both *dugesioides* and *flagellatus* in having 11-12 setae on each side of tergum 9 (18-20 in *dugesioides* and *flagellatus*); the postgonites resemble those of *dugesioides*.

Description

Head. Eyes with about 10 facets of moderate size, their length approximately equal to greatest length of occipital lobes, but less than greatest width of each laterovertex, each of these with the usual 5 strong and 1 minute setae along anterior margin; each occipital lobe with 7 strong and 2 minute setae along posterior margin. Palpi suborbicular, rather densely closed beneath with strong setae, these minute basally, becoming distinctly longer apically, the distal macroseta slightly longer than palpus. Theca approximately as broad as long.

Thorax. Anterior margin slightly projecting at middle and slightly notched at midline; median suture extending to about midlength, transverse suture distinctly angulate, the median portion transverse and less distinct; microtrichia of mesonotum restricted to margins of notopleural suture. Prescutum with 32-34 long setae in a couple of rows across anterior ⅔ and along sides; median discal area with ± 36 shorter setae, these distinctly longer laterally and anteriorly, somewhat denser at middle; scutum with ± 36 setae of about same length as those in median area of prescutum, a row of about 10 short antescutellar setae of approximately the same length, and an additional very long seta on each side, this about half as long as outer pair of scutellar setae; sides of scutum with the usual 4 macrosetae. Scutellum with 4 macrosetae, the 2 median ones distinctly longer. Mesosternum rather broad between coxae, sides strongly oblique, anterior margin subtruncate, feebly arcuately emarginate; metasternal lobe absent. *Wings* and *Legs* very much as in *flagellatus* and ethophallus, without distinctive characters.

Abdomen. Lateral lobes of tergum 1+2 with ± 24 setae, those along posterolateral margin short or of intermediate lengths, the more anterodorsal and posterior setae strong, very long, but without conspicuously long macrosetae. Sternum 2 rather evenly setose, the setae along middle of posterior margin about as long as the discals, becoming conspicuously longer laterally and in posterolateral angles. Female. Lateral connexival setae minute along inner margins of setose area, becoming longer along lateral margins where they are of about the same length of those ventral connexivum. Tergum 7 transversely trapezoidal, with 2 pairs of rather widely separated setae in tandem, the anterior pair longer; it is not clear from the slide preparation whether it is connected by a strap to the supra-anal plate or not; in one anomalous specimen there are 2 additional setae, 1 very long and strong, the other shorter, to the left of tergum 7. Supra-anal plate rather narrow with only 3 distal macrosetae, without setae along lateral margins. Seventh sternites very small, scarcely wider than supra-anal plate, with only ± 10 setae, two of those along anterior margin being macrosetae, the rest much shorter, including several which are about the same length as the distal connexival setae. Male. Sternum 5 well developed, broad, and fairly long, the discal setae rather uniformly covered with setae similar to those of the ventral connexivum, those along distal margin distinctly longer, at least 4 or 5 of those along distal margin and sides conspicuously long, twice or more as long as the discals. Sternum 7+8 with 8 setae of varying lengths, mostly slender, one of the dorsal ones a conspicuous macroseta; tergum 9 with ± 10-11 setae, several of the dorsal ones conspicuously longer macrosetae. Postgonites nearly straight, slightly bent at apices; sides and ventral margins with numerous denticlelike setae; ventral macroseta inserted quite far posteriorly, the accessory seta nearly half as long and placed close to and anterior to the macroseta. Aedeagus narrowly ribbonlike.

Measurements

	Males	Females
BL	1.56	1.70-1.78
TL	0.52	0.58-0.61
WL	1.31	1.50-1.51
WW	0.68	0.72-0.73

Type Data: Male holotype and 2 female paratypes ex 1 *Micronycteris brachyotis* (SVP 18706), Venezuela, T. F. Amazonas, Río Orinoco, Tamatama, 135 m, 4-V-67.

Remarks

This species is named to show appreciation for the remarkable field accomplishments of Arden L. and Merlin D. Tuttle, survey team leaders, and other members of their group.

Trichobius ethophallus, new species

(Fig. 23D, 26F)

Closely resembling *Trichobius dugesioides*, *T. flagellatus*, and *T. tuttlei* in most characters. Females may be separated from these and other species of the *parasiticus* complex by the very

large tergum 7 which bears 13-17 setae (typically 2 pairs in other species). Males may be separated by the numerous setae (16-17) on each side of sternum 7+8, there being 8-9 in *dugesioides*, *flagellatus*, and *tuttlei*. The strongly curved apices of the postgonites are also distinctive.

DESCRIPTION

Head. Eyes very small, longer than wide, transverse, with 8 facets, approximately as long as greatest length of each occipital lobe, and ¾ the width of each laterovertex, these each with 4 strong and 2-3 very short, stout setae, one of these on apical margin, the other 1 or 2 inserted near the strong seta in posteriomedial angle; each occipital lobe with 7 strong setae, and 2 microsetae along posterior margin. Palpi subovate, anterior margins rounded, undersides with rather sparse, short, conspicuous setae, distal macroseta about as long as width of palpus, sometimes as long as palpus. Theca longer than broad; posterior margin of oral cavity rounded.

Thorax. Anterior margin distinctly, broadly, projecting at middle, and sometimes feebly emarginate at midline; median suture extending less than half the length of prescutum, transverse suture feebly arcuate, less well defined along middle. Microtrichia present along edge of notopleural suture, those of prescutum extending medially to enclose the 2 posterior, long, marginal setae; those on scutum restricted to margins of suture. Prescutum with 32-34 long setae, mostly macrosetae, and 22-25 shorter median discal setae, some of these becoming longer laterally and anteriorly. Scutum with 40-52 short discal setae similar to the median discals of prescutum, and with the usual 4 macrosetae along lateral margins; setae of antescutellar row only slightly longer than the setae anterior to them, a long seta at each end of row.

Mesosternum rather broadly produced between front coxae, the sides strongly oblique, anterior margin broadly rounded or subtruncate, sometimes slightly indented at middle. Metasternal lobe absent, though in some specimens there appears to be a trace of a translucent margin.

Wings. Without distinctive characters. *Legs.* Outer face of femora clothed with short setae, upper surface of profemora with approximately 10 strong setae on distal ⅔ and a row of 4-5 short strong setae basally; midfemora above with only 4 or 5 fairly long setae on a little more than distal third, and a few shorter ones intermingled with them and with the short setae along sides; hindfemora with about 10 macrosetae above and on each side of these a row of shorter, strong, erect setae.

Abdomen. Lateral lobes of tergum 1+2 with ± 28 setae, the dorsal ones stronger and longer, becoming shorter to short ventrolaterally. Sternum 2 evenly setose. FEMALE. Lateral connexivum with a large cluster of 10-12 or more setae which, though not strikingly long, are conspicuously longer than the very minute lateral connexival setae posterior to them; this cluster merges ventrally with the ventral connexival setae; distally the lateral setae become longer and similar to the ventral ones. Tergum 7 very large, oblong or suborbicular with 13-17 setae, continuous with and wider than the supra-anal plate, this with 4 distal macrosetae, another row of 4 strong setae along base, and a strong seta along each lateral margin. Seventh sternites oval, transverse, rather small with ± 22 setae, those along posterior margin and lateral edge longer, one—near outer margin at middle—longer than the rest, about as long as sternite, the other strong setae shorter; setae along middle of disc and anterior margin very short, about as long as ventral connexival setae. MALE. Lateral connexival setae of male dense, about twice as long as those on venter. Sternum 5 rather evenly clothed with setae of about same size as those on adjacent connexivum excepting along posterior margins where they are longer, becoming about twice as long toward sides. Sternum 6 absent. Sternum 7+8 with 16-17 setae on each side, a few short, 1 distinctly longer than the others; tergum 9 with ± 23 strong setae, those along dorsal and posterior margins longer, the others becoming shorter. Postgonites symmetrical, rather slender, apices rather strongly curved; ventral accessory seta inserted far anterior to the macroseta, the ventral margins and sides clothed with numerous denticles. Aedeagus ribbonlike.

MEASUREMENTS

	Males	Females
BL	1.10-1.30	1.12-1.60
TL	0.38-0.49	0.43-0.51
WL	1.03-1.29	1.01-1.29
WW	0.45-0.73	0.52-0.66

TYPE DATA: Male holotype ex *Lonchorhina orinocensis* (SVP 5840), Venezuela, Apure, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 24-XII-65. Female allotype, same host (SVP 5786) and locality data except 23-XII-65. PARATYPES—APURE: 250 males, 152 females, and 1 sex undet., same host and locality data as holotype but 6-28-XII-65; 7 males and 1 female, same host, 1 km W Pto.

Páez, Cerro de Murciélagos, Pto. Páez, 76 m, 19-24-I-66. T. F. Amazonas: 2 males and 1 female ex *Lonchorhina orinocensis*, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 21-IX-67; 2 males, same host, 30 km S Pto. Ayacucho, Coromoto, Pto. Ayacucho, 126 m, 8-X-67; female, same host, 30 km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 12-X-67.

Trichobius flagellatus, new species
(Fig. 23F, 26C, D)

Females of *Trichobius flagellatus* may be distinguished from *T. ethophallus* n. sp. and other similar species by the conspicuous area of very minute setae on the lateral connexivum behind lateral lobes of tergum 1+2, followed by abruptly longer setae. As in *dugesioides*, tergum 7 is trapezoidal, but whereas it is nearly as wide as the proctiger in *flagellatus*, it is distinctly narrower in *dugesioides*. Males can easily be identified, even most alcohol-preserved specimens, by the extraordinarily long, whiplike aedeagus (hence the name) and the unusually long, slender, curved postgonites.

Description

Head. Eyes transverse, with 9 facets, their length slightly less than greatest width of each laterovertex, these with 5 strong and 1 very short setae on anterior margin; occipital lobes each with 7 strong setae, and 2 short setae along posterior margin. Palpi subovate, the distal macroseta as long as or slightly longer than palpus. Theca approximately as wide as long.

Thorax. Anterior margin straight or feebly produced at middle, the median suture present on slightly less than apical half, the transverse suture feebly angulate, somewhat indistinct at middle. Mesonotal microtrichia distributed as in *T. ethophallus* n. sp. Prescutum with approximately 36 macrosetae anteriorly and along lateral margins; middle of disc with ± 32 shorter setae, none conspicuously short, and becoming slightly longer anteriorly and laterally. Scutum with ± 40 discal setae of approximately same length as median discals of prescutum; setae of antescutellar row almost twice as long as discal setae, and with a much longer seta on each side; 4 macrosetae along each lateral margin. Mesosternum rather broad between the coxae, sides strongly oblique, anterior margin truncate or feebly emarginate.

Wings. Without distinctive characters. *Legs.* Rather short, femora stout; profemora rather evenly clothed with short setae on outer face, dorsal surface with 12-15 longer setae of varying lengths, mostly on about apical ⅔; midfemora with 4-5 conspicuously longer setae on less than apical half of upper surface and 6-8 that are shorter than these but longer than those on lateral surface; hindfemora clothed with numerous long setae on upper surface, especially distal ⅔, a few as long as femur is wide.

Abdomen. Lateral lobes of tergum 1+2 with ± 24 setae, those along ventrolateral margin mostly short, the others mostly macrosetae. Sternum 2 rather uniformly covered with setae that are slightly longer than those on adjoining connexivum; setae along middle of posterior margin of approximately the same length as the discals but becoming conspicuously longer toward sides and in lateral angles. Female. Lateral abdominal connexivum sometimes with a couple of strong short setae behind lateral lobes of tergum 1+2, but otherwise virtually devoid of setae basally except for extremely minute microsetae, these followed on apical half of abdomen by much longer setae, a few shorter ones along inner margin of setose area; the lateral setae distinctly longer than those on venter. Tergum 7 small, trapezoidal, longer than wide, with 2 pairs of widely separated setae in tandem, the anterior pair longer; narrower than and apparently united with the supra-anal plate, the juncture marked by a groove. Supra-anal plate with 4 distal macrosetae, lacking setae on base or margins. Seventh sternites very small, scarcely wider than supra-anal plate, with ± 19 setae, only 1 a conspicuous macroseta, this as long as those of supra-anal plate, the others mostly strong along distal and lateral margins, shorter on disc and anterior margin. Male. Lateral connexival setae of male rather dense, long and moderately coarse, longer than the ventrals. Sternum 5 well developed, the discal setae about as long as those on venter but those on posterior margin, even those at middle, approximately twice as long as the discals and toward the sides and in posterolateral angles, becoming about 2½ to 3 times as long as the discals, the lateral ones being macrosetae. Sternum 6 absent, 7+8 with 8-9 strong, mostly long setae on each side, including strong macroseta, the most dorsomedial one quite short, the others of varying lengths, tergum 9 with 22-25 setae on each side, a couple of them macrosetae, the others of varying lengths, but all strong and none minute. Postgonites slender throughout length, rather evenly curved, the accessory seta inserted far anterior to the macroseta and quite long; with a microseta inserted above accessory seta, a couple near midlength on ventral margin, and, distal to these, a

series of sensillae on margin and apices. Aedeagus long, coiled, flagelliform.

MEASUREMENTS

	Males	Females
BL	1.33-1.44	1.32-1.63
TL	0.44-0.51	0.50-0.53
WL	1.13-1.27	1.27-1.35
WW	0.56-0.65	0.62-0.69

TYPE DATA: Male holotype (SVP 2563) and female allotype (SVP 2554) ex *Lonchorhina aurita*, Venezuela, Trujillo, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 3-IX-65. PARATYPES—BARINAS: 1 male ex *Lonchorhina aurita*, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67. BOLÍVAR: 8 males and 6 females ex *Lonchorhina aurita*, 20 km W La Paragua, Hato San José, 300 m, 8-IV-67. DTO. FEDERAL: 1 male and 2 females ex *Lonchorhina aurita*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 380-398 m, 21-VIII-66. MIRANDA: 1 male and 2 females ex *Lonchorhina aurita*, 4 km SW Birongo, Cueva Walter Dupouy, Birongo, 195 m, 28-I-68; 5 males and 9 females, same host, Birongo, 60 m, 22-23-I-68. T. F. AMAZONAS: 1 male and 1 sex undet. ex *Lonchorhina orinocensis*, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 13-IX-67; 1 male ex *Lonchorhina aurita*, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 6-II-67; 1 male and 1 female, same host, 84 km SSE Esmeralda, 7 km up Río Mavaca, 138 m, 2-III-67.

HOST ASSOCIATIONS

Of 55 specimens of *Trichobius flagellatus* collected by the survey teams, 53 (96 percent) were from 19 *Lonchorhina aurita* and 2 ex 2 L. orinocensis.

Trichobius diphyllae Wenzel
(Fig. 23B, 25B)

Trichobius diphyllae Wenzel, 1966:492, Fig. 68B, 73B

This species was not collected by the survey teams, but the original series included 7 paratypes collected from *Diphylla ecaudata* at Rancho Grande (El Limón), Aragua.

Trichobius diaemi, new species
(Fig. 23C, 26J)

Very similar to *Trichobius parasiticus* Gervais, but differing in mesonotal chaetotaxy in that scattered, short, discal setae are present on prescutum anterior to the row in front of the transverse suture (rarely a couple of such setae in *parasiticus*); in having scattered discal setae on the scutum in front of the W-shaped antescutellar row; and in lacking a cluster of prominent setae on sides of the male postgonites.

DESCRIPTION

Head. With the characters of *T. parasiticus* Gervais, except as follows: *Thorax.* Prescutum without a short seta on each side of median suture behind anterior margin (usually present in *parasiticus*); median setae of transverse row in front of suture not noticeably longer or set apart from other setae of this row (4-5 of them somewhat longer in *parasiticus*), 2 setae at each end of this row strong and coarse (only 1 in *parasiticus*); scattered discal setae nearly always present on scutum (not so in *parasiticus*), the W-shaped transverse row of antescutellar setae usually consisting of more than a single row (sometimes irregular and appearing double at middle in *parasiticus*). Microtricha of mesonotum as in *parasiticus;* that is, present as a longitudinal band along lateral margins, this band enclosing the marginal macrosetae and usually extending to or enclosing the second seta from lateral margin as well, and extending along anterior margin about half-way to median suture; microtrichia along lateral edges of scutum enclosing the marginal setae. MALE. Postgonites (Fig. 26J) bladelike as in *parasiticus* (Fig. 25A) but not quite as wide, lacking the cluster of prominent setae above the ventral macroseta but with numerous thornlike setae or denticles in conspicuous sockets, on a little more than distal half of lateral face.

MEASUREMENTS

	Males	Females
BL	1.16-1.48	1.16-1.59
TL	0.39-0.49	0.44-0.54
WL	0.94-1.23	1.09-1.21
WW	0.49-0.73	0.55-0.82

TYPE DATA: Male holotype and female allotype ex *Desmodus youngii* (SVP 26861), Venezuela, T. F. Amazonas, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 17-18-VII-67. PARATYPES—SUCRE: 3 males and 1 female ex *Desmodus youngii*, 21 km E Cumaná, 1 m, 21-23-XII-66; 17 males and 15 females, same host, 9 km NE Güiria, Ensenada Cauranta, 4 m, 5-VI-67. T. F. AMAZONAS: 5 males and 4 females ex *Desmodus youngii*, 14 km SSE Pto. Ayacucho, Chaparito, Pto. Ayacucho, 119 m, 2-X-67; 28 males, 14 females, and 5 sex undet., same host, 28

km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-X-67; 9 males and 9 females, same host and locality data as holotype. COLOMBIA: 2 males ex *"Diaemus youngi,"* Guainia, nr. Amanaven, 7-IX-67, C. J. Marinkelle.

Other Material Examined

TRINIDAD: 1 female "ex *Diaemus*," Greenhall; 1 female, St. Patrick Co., Siporia, Alta Graces Trace, XII-54.

Trichobius parasiticus Gervais
(Fig. 23A, 25A)

Trichobius parasiticus Gervais, 1844:14, Pl. 43, Fig.—Wenzel, Tipton, and Kiewlicz, 1966: 494, Fig. 68A, 73A

Trichobius kesseli Guimarães, 1938:660, Fig. 9 (nom. nov., in error)

Venezuelan Survey Records (2,636 males, 1,624 females, 20 sex undet.)

This well-known species occurs on the vampire bat, *Desmodus rotundus*, throughout its range.

To briefly summarize, the survey teams collected this fly at 75 localities in 17 states as follows: Apure (6 localities, 24-76 m); Barinas (3 localities, 611-1,070 m); Bolívar (2 localities, 300-1,032 m); Carabobo (4 localities, 25-1,537 m); Dto. Federal (2 localities, 1,507-2,240 m); Falcón (5 localities, 2-470 m); Guajira (1 locality, 15 m); Guárico (3 localities, 100-181 m); Lara (1 locality, 580 m); Miranda (7 localities, 1-570 m); Monagas (3 localities, 18-1,180 m); Nueva Esparta (8 localities, 1-53 m); Sucre (6 localities, 1-380 m); T. F. Amazonas (12 localities, 119-161 m); Trujillo (7 localities, 29-164 m); Yaracuy (1 locality, 25 m); Zulia (4 localities, 15-270 m).

Host Associations

Of, 4,280 specimens of *Trichobius parasiticus* collected by the survey teams, 4,146 (96.8 percent) were from 91 *Desmodus rotundus*. The remaining 135 specimens were from 38 bats of 21 species, and, although many of these are clearly transitory associations and contaminations, this number is not surprising. In general (see Wenzel et al., 1966:638-641), the larger the series of bats collected, especially of species which roost in or near a wide variety of other species, the greater will be the number of parasite records representing disturbance and other transitory transfers and contaminants. Some records are puzzling, e.g., the 17 specimens from 2 *Vampyrops umbratus*, 16 ex 1 *Chiroderma villosum*, and 26 ex 6 *Carollia perspicillata*. Some of these may represent errors of labeling either in the field or the laboratory. A few labels were difficult to decipher.

Trichobius longipes group

Species of this group are parasitic on phyllostomine bats of the genera *Tonatia* and *Phyllostomus*. There appears to be a distinct but very similar species on each species of *Tonatia*. Identification of species of this complex is extremely difficult without authentic comparative reference material.

Trichobius costalimai Guimarães
(Fig. 27A, 28B)

Trichobius costalimai Guimarães, 1937:660, Pl. 3, Fig. 10.—Wenzel, Tipton, and Kiewlicz, 1966: 471, Fig. 63E, 67B

Venezuelan Survey Records (1,326 males, 759 females, 69 sex undet.)

This common, widely distributed species occurs on its characteristic host, *Phyllostomus discolor*, throughout its range.

To briefly summarize, the survey teams collected this fly at 34 localities in 13 states as follows: Barinas (1 locality, 611-620 m); Bolívar (2 localities, 150-306 m); Carabobo (2 localities, 60-598 m); Dto. Federal (2 localities, 380-1,507 m); Falcón (4 localities, 25-480 m); Guárico (2 localities, 181-630 m); Miranda (3 localities, 1-60 m); Monagas (2 localities, 18-1,165 m); Nueva Esparta (2 localities, 47-53 m); Sucre (2 localities, 1-380 m); T. F. Amazonas (4 localities, 126-195 m); Trujillo (2 localities, 60-164 m); Zulia (6 localities, 37-270 m).

Other Venezuelan Material Examined

ARAGUA: 4 males and 4 females ex *Phyllostomus discolor*, Rancho Grande, 31-VIII-62, C. Machado and R. Antequera.

Host Associations

Of 2,154 specimens of *Trichobius costalimai* collected by the survey teams, 2,111 (96 percent) were from 285 *Phyllostomus discolor*, the characteristic host. The remaining 43 specimens were from 16 bats of 10 species, and probably most are contaminants or represent transfers. In nearly all instances these bats were collected at the same localities on the same dates as were specimens of *P. discolor*.

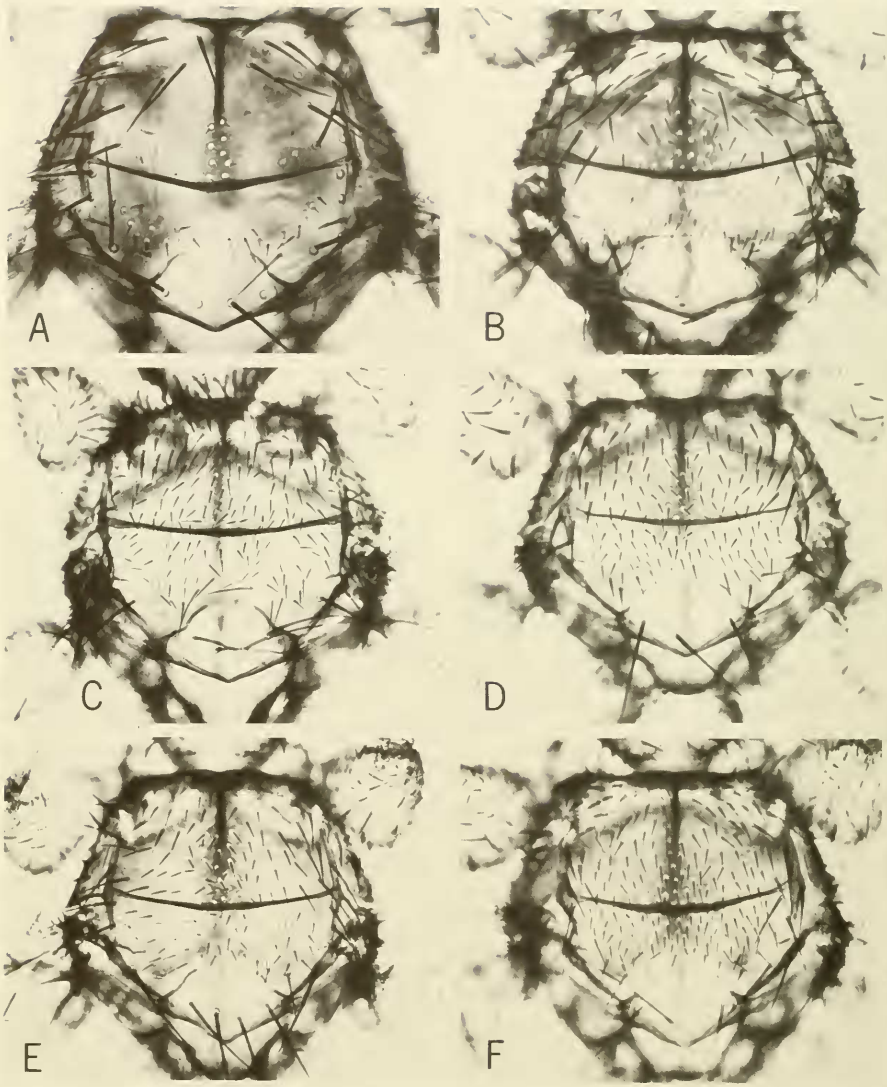

Fig. 27. Thorax, dorsal view, of species of the *Trichobius longipes* and *dunni* groups: A, *Trichobius costalimai* Guimarães, male; B, *Trichobius longipes* (Rudow), female; C, *Trichobius jubatus*, new species (female allotype); D, *Trichobius silvicolae*, new species (male holotype); E, *Trichobius strictisternus*, new species (male holotype); F, *Trichobius affinis*, new species (male holotype). A from Wenzel et al. (1966).

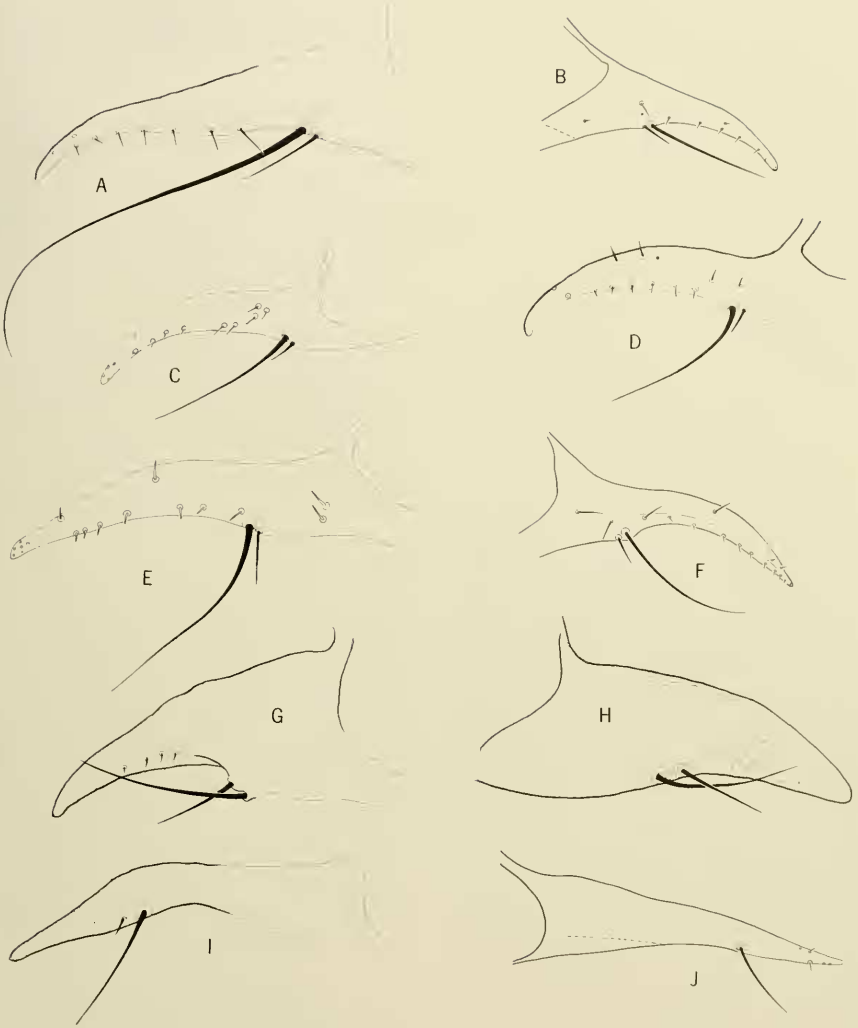

Fig. 28. Male postgonites of species of the *Trichobius dunni, longipes,* and *phyllostomae* groups: A, *Trichobius jubatus,* new species (holotype); B, *Trichobius costalimai* Guimarães; C, *Trichobius affinis,* new species (SVP 1790); D, *Trichobius silvicolae,* new species (holotype); E. *Trichobius strictisternus,* new species (holotype); F, *Trichobius longipes* (Rudow); G-H, *Trichobius hispidus,* new species (holotype); I, *Trichobius petersoni,* new species (SVP 4466); J. *Trichobius vampyropis* Wenzel. All drawn to same scale except B, C, F, from Wenzel et al. (1966).

Trichobius longipes Rudow
(Fig. 4A, 27B, 28F)

Trichobius longipes Rudow, 1871:121.—Wenzel, Tipton, and Kiewlicz, 1966:465

Trichobius mixtus Curran, 1935:10, Fig. 10.—Wenzel, Tipton, and Kiewlicz, 1966:465, Fig. 62A, E; 63F; 64.

Trichobius dugesii, authors (part), not Townsend.

Venezuelan Survey Records (372 males, 290 females, 1 sex undet.)

APURE: 1 female ex 1 *Molossus ater*, Pto. Páez, 76 m, 17-I-66; 50 males and 33 females ex *Phyllostomus hastatus*, 29 km SSW Santa Domingo, Selvas de San Camilo, Nulita, 24 m, 17-I—I-II-68.

BARINAS: 1 male and 3 females ex *Phyllostomus hastatus*, Altamira, 794 m, 21-XII-67.

BOLÍVAR: 1 female ex *Phyllostomus elongatus*, 25 km SE El Manteco, Los Patos, 150 m, 5-IV-66; 5 males and 13 females ex *Phyllostomus hastatus*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 8-20-VI-66; 1 male, same host, Icabarú, 473 m, 9-V-68; 2 males, same host, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66.

CARABOBO: 1 male ex *Phyllostomus hastatus*, 3 km SW Montalbán, Hda. La Canada, Montalbán, 618 m, 22-XI-67; 1 male, same host, 6 km N Urama, Urama, 60 m, 17-III-66.

FALCÓN: 3 males and 6 females ex *Phyllostomus hastatus*, 80 km NW Carora, Río Socopito 480 m, 20-V-68; 1 male and 1 female, same host, 19 km NW Urama, km 40, Urama, 25 m, 20-X-65.

GUÁRICO: 2 males and 2 females ex *Phyllostomus hastatus*, 1 male ex 1 *Desmodus rotundus*, 20 males and 14 females ex *Phyllostomus elongatus*, 14 km SE Calabozo, nr. Río Orituco, Est. Biol. de los Llanos, 100 m, 21-23-VIII-68; 8 males and 2 females, same host, 9 km SE Calabozo, Est. Biol. de los Llanos, 100 m, 20-VIII-68.

MIRANDA: 2 males ex *Phyllostomus hastatus*, Birongo, 60 m, 23-I-68; 8 males, 3 females, and 1 sex undet., same host, Cueva Alfredo Jahn, Birongo, 60-160 m, 20-I-68; 3 females, same host, 16 km SSE Caracas, San Andres, 950 m, 30-XII-65.

MONAGAS: 2 males and 1 female ex *Phyllostomus elongatus*, 16 males and 5 females ex *Phyllostomus hastatus*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-4-VI-68.

SUCRE: 20 males and 36 females ex *Phyllostomus hastatus*, 10 km NE Güiria, Ensenada Cauranta, 90 m, 7-VI-67; 20 males and 11 females, same host, 26 km ESE Carúpano, Manaeal, 175-320 m, 21-31-VII-67.

T. F. AMAZONAS: 1 female ex *Uroderma bilobatum*, 2 males and 1 female ex 3 *Artibeus jamaicensis*, 1 female ex 1 *Rhynchonycteris naso*, 14 males and 16 females ex *Phyllostomus elongatus*, 108 males and 60 females ex *Phyllostomus hastatus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-28-VII-67; 4 males and 2 females, same host, 2 males and 3 females ex *Phyllostomus elongatus*, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 13-IX—4-X-67; 1 male and 2 females, same host, 1 male and 1 female ex *Phyllostomus hastatus*, Río Orinoco, Tamatama, 135 m, 27-IV—7-V-67; 4 males and 7 females, same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 29-V—1-VI-67; 1 male and 2 females, same host, 30 km S Pto. Ayacucho, Coromoto, Pto. Ayacucho, 126 m, 11-IX-67; 3 males and 1 female, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 6-7-IX-67; 1 male and 1 female, same host, 33 km S Pto. Ayacucho, El Raudal, Pto. Ayacucho, 195 m, 20-IX-67; 2 males and 2 females ex *Phyllostomus elongatus*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 20-II-66—24-III-67; 6 males and 8 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-14-IV-67.

TRUJILLO: 1 male ex *Phyllostomus hastatus*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 5-IX-65; 5 males and 3 females, same host, 23 km N Valera, nr. Agua Viva, Valera, 164 m, 16-IX-65; 1 female, same host, 23 km NNW Valera, Río Motatan, Valera, 90 m, 2-IX-65; 7 males and 1 female, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 18-22-X-65.

YARACUY: 1 female ex *Uroderma bilobatum*, 10 km NW Urama, El Central, Urama, 25 m, 14-III-66; 16 males and 13 females ex *Phyllostomus hastatus*, 11 km NW Urama, El Central, Urama, 25 m, 14-III-66; 4 males and 1 female, same host, 13 km NW Urama, El Central, Urama, 25 m, 20-III-66.

ZULIA: 24 males and 22 females ex *Phyllostomus hastatus*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III—1-IV-68; 2 males and 5 females, same host, 33 km NW La Paz, nr. Cerro Azul, 75 m, 13-VI-68.

Other Venezuelan Material Examined

ARAGUA: 2 males and 2 females ex *Phyllostomus hastatus*, Alfredo Jahn Cave, 7-V-61, J. Racenis, J. Ojasti, and C. Bordon.

Host Associations

Of 663 specimens of *Trichobius longipes* collected by the survey teams, 551 (83 percent) were from 180 *Phyllostomus hastatus* and 104 (15.7 percent) from 34 *P. elongatus*. The other records clearly represent contaminants, tempo-

rary transfers, or errors of labeling. The records from *P. elongatus* are interesting, because this bat does not appear to be parasitized by any "characteristic" species of streblid, but rather by a number of species whose primary associations are with other hosts.

Remarks

I am not certain that all of the above specimens represent a single species. There appear to be slight differences between the populations whose geographic distributions parallel those of *Phyllostomus hastatus hastatus* and *P. h. panamensis*. Should these flies prove to be specifically distinct, then the name *T. mixtus* Curran would have to be revived for the species from *P. h. hastatus*.

Trichobius silvicolae, new species
(Fig. 27D, 28D)

Virtually identical to *Trichobius dybasi* Wenzel but with very different male postgonites. Those of *dybasi* are rather thick at base and very strongly curved, the apices at right angles to the base. Those of *silvicolae* (Fig. 28D) are distinctly more slender and more evenly tapered and curved.

Description

Similar to *Trichobius dybasi* Wenzel (1966: 469) and the description of that species applies in all particulars excepting the male postgonites. In *silvicolae* these are rather evenly tapered and curved, each with ± 5 distinct, very short setae along ventral margin, 2 more inserted above the macroseta, another near dorsal margin at about midlength, and 4-5 distal sensillae; accessory seta relatively short, inserted next to and anterior to macroseta, which extends nearly to apex of postgonite.

Measurements

	Males	Females
BL	1.42-1.64	1.57-1.86
TL	0.54-0.59	0.58-0.67
WL	1.16-1.21	1.32-1.38
WW	0.60-0.67	0.64-0.74

Type Data

Male holotype and female allotype ex *Tonatia silvicola* (SVP 19359), Venezuela, T. F. Amazonas, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V-67. Paratypes—Bolívar: 1 female ex 1 *Phyllostomus hastatus*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 15-VI-66. T. F. Amazonas: 6 males and 3 females ex *Tonatia silvicola*, 56 km NNW Esmeralda, Río Cunucumuma, Belén, 150 m, 3-I-67; 5 males, 4 females, and 1 sex undet., same host and same data as holotype but 12-VI-67; 1 male and 1 female, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-12-IV-67.

Remarks

The single specimen from *Phyllostomus hastatus* is probably a "stray." *Trichobius silvicolae* and *T. dybasi* appear to be allopatric on the same host species. In addition to the type series of *dybasi* from Panama, I have seen 3 males and 3 females of *dybasi* from Peru (Piura, Salitral) on the Pacific slope of the Andes. These are also from *Tonatia silvicola*.

Trichobius affinis, new species
(Fig. 27F, 28C)

Almost identical to *Trichobius mendezi* (ex *Tonatia minuta*) in chaetotaxy, the shape of the oral cavity, and female abdominal structures. Apparently differing from that species only in the shape of the theca—which is distinctly longer than broad, with strongly converging sides in *mendezi*—and in the shape of the male postgonites.

Description

With the characters of *Trichobius mendezi* Wenzel (loc. cit., p. 469), and the description of that species applies equally well to *affinis* n. sp. except that: in *affinis* the theca is distinctly longer than broad, but sides not strongly convergent to apex; apices of male postgonites slender but not as narrowed as in *mendezi*. As in *mendezi*, the microtrichia of the presentum are limited to the margin of the notopleural suture and do not extend inwardly past the marginal macrosetae.

Measurements

	Males	Females
BL	1.53-1.79	1.69-1.70
TL	0.58-0.59	0.60-0.64
WL	1.19-1.26	1.35-1.39
WW	0.62-0.66	0.69-0.72

Type Data: Male holotype ex *Tonatia brasiliensis* (SVP 29348) and female allotype, same host (SVP 29551), Venezuela, T. F. Amazonas, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 27-VII-67. Paratypes—Apure: 1 male and 1 female ex *Tonatia brasiliensis*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 23-I-68. Falcón: 2 males and 1 female ex *Tonatia brasiliensis*, 19 km NW Urama, Km 40, Urama, 24-25 m, 20-27-X-65. T. F. Amazonas: 1 male, same data as the holotype.

Trichobius strictisternus, new species
(Fig. 27E, 28E)

Distinct from all other species of the group in its narrowly rounded anterior mesosternal margin—which resembles that of species of the *caecus* group—and in the more densely setose sternum 7+8 (9 setae as opposed to 5 or 6 in most species of group). The chaetotaxy of the abdomen, including sterna 2 and 5, resembles that of *silvicolae*, but the setae are slightly denser and, on apical margin of sternum 5, are distinctly longer. The male postgonites resemble those of *silvicolae*.

DESCRIPTION

Head. Eyes with 11 large facets, their length distinctly less than greatest width of a laterovertex. Each occipital lobe with about 7 conspicuous long setae, 1 or 2 shorter strong ones along posterior margins, and 1 minute seta ventral to these. Palpi oval, slightly longer than broad, feebly pointed at apex; underside bare on about apical fourth. Theca nearly triangular. Sides of oral cavity moderately convergent to base. Mesonotal chaetotaxy as in Fig. 27E. Microtrichia present only along edges of notopleural sutures. *Wings* and *Legs*. Without distinctive characters.

Abdomen. MALE. Dorsolateral connexival setae slightly shorter along inner edge of setose area, the rest of the setae longer and somewhat coarse, appearance hirsute; ventral connexival setae conspicuously shorter. Sternum 2 basally with fairly short setae that are only slightly longer than the connexival setae, becoming only slightly longer apically; setae along posterior margin distinctly longer, becoming longer laterally, the longest ones nearly twice the length of the anterior discal setae. Sternum 5 basally with setae of about same size as the connexival setae adjacent to them, but becoming about twice as long apically, some of those on apical margin, toward sides, 2-½ to 3 times as long as the shorter discal setae. Sternum 7+8 with ± 9 setae on each side, including 2 or 3 short setae near dorsomedial margin, the others strong setae, some of them long macrosetae. Tergum 9 with 11-12 setae, 4-5 of them macrosetae, 5-6 of the most ventral ones short. Postgonites as in Fig. 28E. FEMALE. Unknown.

MEASUREMENTS

	Male holotype
BL	1.90
TL	0.67
WL	1.47
WW	0.75

TYPE DATA: Male holotype ex *Tonatia carrikeri* (SVP 28813), Venezuela, T. F. Amazonas, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 24-VII-67.

Trichobius dunni group

Trichobius dunni Wenzel was treated as a member of the *Trichobius longipes* group by Wenzel et al. (1966, p. 474). With the discovery of additional species that are related to *dunni*, it is clear that *dunni*, *T. cognatus* Peterson and Hurka, *T. jubatus* n. sp., and *T. imitator* n. sp. form a distinctive species group.

Species of this group appear to be characteristic parasites of bats of the family Molossidae. A possible exception is *T. imitator* n. sp. (q.v.), which is recorded as having been taken from *Anoura* sp. A. Together with other undescribed ones, these form a distinctive assemblage of species that possess most characters of the *longipes* group, especially the fusion of the metasternal lobe and metepimeron; but they differ in being generally much more densely setose and also as follows:

Occipital lobes densely setose, each with 15-21 or more strong setae, as opposed to 7 or 8 in species of the *longipes* group. Each laterovertex with 14-15 or more setae (several of them macrosetae), including a group of 8-9 short thornlike setae along anterior margin, in contrast to 5 or 6 setae, 3 of them macrosetae, in the *longipes* group. Setae along inner or inner ventral margin of protibiae conspicuously longer than the others, as are 1-2 ventrolateral rows of stronger setae on meso- and metatibiae, all of these longer setae becoming short and merging with other setae distally. Male aedeagus narrowly half-spear shaped in profile, rather than ribbonlike as it is in the *longipes* group.

Trichobius imitator, new species

Distinct from all other species of *Trichobius* in the following combination of characters: the densely setose occipital lobes of the head, the large multifaceted eyes (25-27 facets), the distinctive mesonotal chaetotaxy, the metasternal lobe united with metipimeron, the large female tergum 7 with numerous setae, and the subconical-flangelike ventral arc. Superficially resembling *T. dunni* Wenzel, *T. cognatus* Peterson and Hurka, and *T. jubatus* n. sp., but differing from all of these in its large multifaceted eyes and the large setose tergum 7.

DESCRIPTION

Head. Approximately as long as broad. Eyes very large and conspicuous, with 25-27 conspicu-

ous facets, much longer than greatest width of each laterovertex and longer than greatest length of each occipital lobe. Each laterovertex rather narrow, elongate, with 6 long, strong setae (4 of them macrosetae) and, along anterior margin, a dense series of 8-9 shorter thornlike setae; each occipital lobe with 17-18 very strong setae, most of them macrosetae, the most anterior one conspicuously longer than the rest, those along posterior edge shorter than the others. Palpi elongate, oval, distinctly longer than broad, apical margins rounded, the ventral surface very densely studded with short, thornlike setae as are the lateral margins, the distal macrosetae about as long or slightly longer than the palpi. Theca slightly longer than broad, nearly triangular.

Thorax. Relatively long, anterior margin slightly rounded, median suture present on about anterior half, transverse suture distinctly angulate. Prescutum with 85-90 setae including a cluster of 8-9 strong setae in each anterior angle, 7 or 8 macrosetae along each side, and medial to these a series of somewhat shorter setae which merge into a median discal area of about 26-27 denser, relatively short setae; a conspicuous bare area on each side of median suture and a little more than middle half of anterior margin. Scutum with ± 43-45 short setae similar to those in the median area of prescutum, a row of much longer antescutellar setae, several of them macrosetae, and 5 macrosetae along each lateral margin; microtrichia restricted to margin of notopleural suture. Scutellar setae about as long as scutellum is wide. Lateral angles of mesosternal projection rounded, apical margin not very wide, subarcuate, sides strongly oblique. Metasternum somewhat longer than in most species; apical lobe well developed, ascending dorsally to unite with the metepimeron.

Wings. Without distinctive characters except that *R* has a macroseta and a couple of strong shorter setae; base of fifth vein with 2 strong macrosetae, base of third bare without either macrosetae or short setae; third crossvein much closer to the first than to the second.

Legs. All tibiae clothed with very short but strong, conspicuous setae. Inner face of profemora with numerous short, strong setae that become a little longer distally and dorsally; outer face with much more slender, short setae which become long distally and dorsally; upper surface with about 6 macrosetae just before midlength, these becoming somewhat shorter but still very strong distally. Midfemora with strong setae on lateral face, these very short basally, longer distally; a few scattered macrosetae on apical half of dorsal surface. Outer face of hindfemora with short, fine setae basally, and longer ones distally; upper face densely clothed with long setae, including a number of macrosetae.

Abdomen. Lateral lobes of tergum 1 + 2 with ± 18 strong setae, the more dorsal ones mostly macrosetae, and 7 or 8 shorter, finer setae ventrally. Sternum 2 with rather uniform and rather dense setae, those along posterior margin somewhat longer, becoming much denser and longer toward sides. Female. Dorsal connexivum with a row of setae across apex in front of tergum 7, a couple of these very strong and rather long; lateral connexival setae short but strong, dense; setae of venter a little shorter than those on lateral margins. Tergum 7 (difficult to see in the unique type), very large, broader than the supra-anal plate, and apparently subtriangular, the apex anterior, rounded, basal margin apparently arcuate; each side with a cluster of 5 very strong setae, several of these are rather short, one is of intermediate length, and the fifth and most posterior and mesal one is a macroseta; 3 microsetae situated between the macrosetae. Supra-anal plate with 2 very slender discal setae that are a little shorter than the plate is wide, and anterior to them about 13-14 other short setae, consisting of 2 widely separated pairs along anterior margin, 6 in a row across middle and 3 or 4 along apical margin. Seventh sternites very large, suborbicular, each much wider than supra-anal plate; with about 21 shorter setae on anterior half, these becoming longer laterally, and 15-16 macrosetae, some of them very long and dense. Ventral arc, viewed from beneath, appearing as a hollow subtruncate cone, its dorsal articulation, viewed from above, appearing as a distinct, wide, rather long flange.

Measurements

	Female
BL	2.16
TL	0.82
WL	1.78
WW	0.87

Type Data: Female holotype ex *Anoura* "sp. A" (SVP 12983), Venezuela, Bolivar, 47 km ESE Caicara, Hato La Florida, 50 m, 5-V-67.

Host Associations

Since the other species of this complex are characteristic parasites of Molossidae, and since only 1 specimen of *Trichobius imitator* was collected, I doubt that the host of the type is the characteristic host of this species. It is more

apt to be a parasite of *Molossus azteeus*, which was collected at the same time.

REMARKS

The only other known species of *Trichobius* which have such large multifaceted eyes are members of the *phyllostomae* group.

Trichobius jubatus, new species

(Fig. 27C, 28A)

Very similar to *Trichobius dunni* Wenzel (1966:474) and *T. cognatus* Peterson and Hurka (1974:1056). Differing from both in its very densely setose mesonotum, the total number of prescutal and scutal setae of all types being 185-200 in *jubatus* n. sp., ± 116 in *dunni*, and ± 150 (male holotype) in *cognatus*. The female of *dunni* is unknown. The setation of sterna 7±8 and tergum 9 is nearly identical in *jubatus* and *cognatus*, but in *dunni* these and the lateral lobes of tergum 1+2 appear to have fewer setae. The postgonites are nearly identical to those of *dunni* and *cognatus* but more slender. The seventh sternites of female *jubatus* have 14-16 very strong macrosetae along apex, 9-10 shorter ones anterior to these, and, preceding these, ± 52 short setae of varying lengths, for a total of 75 or more setae ("about 50" in *cognatus*).

DESCRIPTION

Head. Similar to that of *T. imitator*. Eyes with only 10-11 large facets, slightly longer, viewed from above, than greatest width of a laterovertex and distinctly longer than greatest length of occipital lobes. Palpi only slightly longer than broad, not quite as densely setose as in *imitator* n. sp. Each laterovertex with a series of 8-9 short thornlike setae along anterior margin; behind this group are 3 very strong and rather long setae, one a conspicuously long macroseta, another somewhat shorter, the third only about half as long as the macroseta; another macroseta situated above eye; 2-3 other setae situated at inner posterior angle, one of these very strong and rather long, the others successively shorter. Each occipital lobe with about 15 very strong setae, some of them macrosetae, and 4-5 short ones, several of these along posterior margin. Theca subtriangular, slightly wider than long. Mesonotum long, anterior margin rounded, slightly emarginate at middle; median suture rather long, extending to middle or a little beyond; transverse suture rather evenly bowed, sharply defined throughout its width; mesonotum rather convex, densely setose, with 185-200 setae; most setae in a rather broad median area of prescutum very short, as are those on scutum; prescutal setae gradually becoming longer anteriorly, especially 5-7 very strong ones in anterior angles and 8-10 very long ones along lateral margins, where they are conspicuously longer than the other setae; scutum with 5 macrosetae along lateral margins; antescutellar row variable, at times composed of only very short setae like those of the disc but with a longer conspicuous seta at each end, sometimes entirely or almost entirely composed of rather long setae that are about half as long as the macrosetae in posterolateral angles; microtrichia present along margins of the notopleural sutures. Scutellar setae long, slightly longer than scutellum. Anterior projection of mesosternum with strongly oblique sides, the anterior margin rather narrow, subarcuate. Metasternal lobe united with the metepimeron.

Wings. Third vein bare basally in some specimens, in others with a few small and 1 strong setae.

Legs. Very similar to those of *imitator* but not quite as densely setose. Protibiae with conspicuously longer and distinctly stronger setae along inner ventral margin, theca becoming short and merging with the other setae distally; meso- and metatibiae basally with a row of much longer and distinctly stronger setae along outer ventral margin, these becoming shorter, indistinguishable from the others a little beyond midlength.

Abdomen. Lateral lobes of tergum 1+2 with ± 25 setae, the dorsal ones much stronger, several of them conspicuous macrosetae, the ventral ones much shorter. Sternum 2 rather evenly covered with short setae, these distinctly longer than ventral connexival setae, those of apical margin and lateral angles noticeably longer. FEMALE. Lateral connexival setae rather short, distinctly longer near apex, a cluster of somewhat longer, stronger setae present behind lateral lobes of tergum 1+2, this cluster extending ventrally; ventral connexival setae scarcely longer than the laterals, becoming minute apically. Tergum 7 not sclerotized but represented by 2 minute setae. Surpa-anal plate a little broader than long, with 13-14 minute setae along base, near apex, and in between. Seventh sternites very large, oval, densely covered with setae, these moderately short but very strong on most of disc, longer along inner apical margin, 14-16 of them macrosetae of varying lengths on outer distal portion. Ventral arc strongly arched, the sides appearing flanged in slide preparations. MALE. Connexival setae very similar to those of female, including a cluster of stronger setae behind lateral lobes of tergum 1+2. Sternum 5

well sclerotized, apical margin slightly emarginate at middle; basal discal setae similar to those of the ventral connexivum, but becoming somewhat longer apically and laterally, distinctly longer along apical margin and in posterolateral angles. Sternum 6 present. Each side of sternum 7+8 with 32-43 strong setae of varying lengths, including 1 macroseta near dorsal surface, these becoming shorter ventrally. Tergum 9 with 9-33 setae on each side, about 6 of these very long, strong macrosetae, 7-8 others along posterior margin strong but not as long as the preceding macrosetae, 4-5 along ventral margin long and slender (1 a very slender macroseta), the remaining setae rather short. Postgonites as in Fig. 28A.

Measurements

	Males	Females
BL	1.80-2.10	1.94-2.30
TL	0.68-0.76	0.76-0.80
WL	1.64-1.73	1.76-1.86
WW	0.77-0.88	0.79-0.92

Type Data

Male holotype ex *Molossus ater* (SVP 5735) and female allotype, same host (SVP 5738), Venezuela, Apure, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 17-XII-65. Paratypes—Apure: 1 female ex *Molossus ater*, 46 km NE Pto. Páez, Hato Cariben, 76 m, 17-XII-65; 3 males and 2 females, same host, same data as the holotype but 13-17-XII-65. Monagas: 10 males and 4 females ex *Molossus ater*, 5 km NW Caripe, San Agustín, 1,160 m, 28-VI—8-VII-67. T. F. Amazonas: 2 males ex *Molossus ater*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 7-I-67; 1 male and 1 female, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 18-24-VII-67, 1 male ex *Molossus aztecus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 25-VII-67.

Remarks

Through the kindness of Dr. B. V. Peterson, I have been able to examine the male holotype of *Trichobius cognatus*. Because it is preserved in glycerin, I could not make careful comparison of the postgonites with those of *jubatus*, which are mounted in balsam.

Trichobius phyllostomae group

The species of this group appear to be restricted to bats of the genera *Sturnira* and *Vampyrops*. Three species were represented in the Venezuelan collections, namely *Trichobius vampyropis* (from 2 species of *Vampyrops*), *T. petersoni* n. sp. (from *Sturnira erythromos* and *S. bogotensis*), and *T. hispidus* n. sp. (from *Sturnira erythromos*). Interestingly, none were taken from *Sturnira lilium* or *S. ludovici*. This is puzzling, because members of the *phyllostomae* group occur on *S. lilium* in southern Brazil and on *S. ludovici* in Panama. Their absence on these bats in Venezuela can hardly be an artifact of collecting, since about 2,000 Streblidae, of several species in 2 genera, were taken from the more than 2,000 specimens of *Sturnira l. lilium* and 363 *S. ludovici* that were collected in Venezuela.

The two new species, *T. petersoni* and *T. hispidus*, have greatly elongated hindlegs, which, together with a great similarity in dorsal appearance of the head and the form of the mesosternum, appear to represent remarkable instances of convergence in form and structure with species of *Speiseria* (q.v.). However, they are easily distinguished from species of that genus by the absence of scattered macrosetae on the meso- and metatibiae, the absence of macrosetae along the angle of the sixth longitudinal wing vein, and other less obvious characters.

Trichobius vampyropis Wenzel

(Fig. 28J, 29C)

Trichobius vampyropis Wenzel, 1966:500, Fig. 74B, 75C

Venezuelan Survey Records (16 males, 14 females)

BARINAS: 1 female ex *Vampyrops vittatus*, 2 km SW Altamira, Altamira, 619 m, 5-I-69.

DTO. FEDERAL: 5 males and 1 female ex *Vampyrops vittatus*, 6 males and 8 females ex *Vampyrops umbratus*, 4 km NNW Caracas, Los Venados, 1,400-1,524 m, 22-VII—3-VIII-65; 2 males and 1 female, same host, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,092 m, 20-29-VIII-65.

MIRANDA: 2 males and 3 females ex *Vampyrops umbratus*, 5 km NNW Guarenas, Curupao, 1,160 m, 5-12-X-66; 1 male, same host, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,110 m, 23-VIII-65.

Other Venezuelan Material Examined

DTO. FEDERAL: 2 males and 2 females ex *Vampyrops* sp., Silla de Caracas, 2,200 m, 21-X-62, J. Ojasti.

Host Associations

Of 30 specimens of *Trichobius vampyropis* collected by the survey teams, 23 (76.6 percent) were from *Vampyrops umbratus*, the rest from

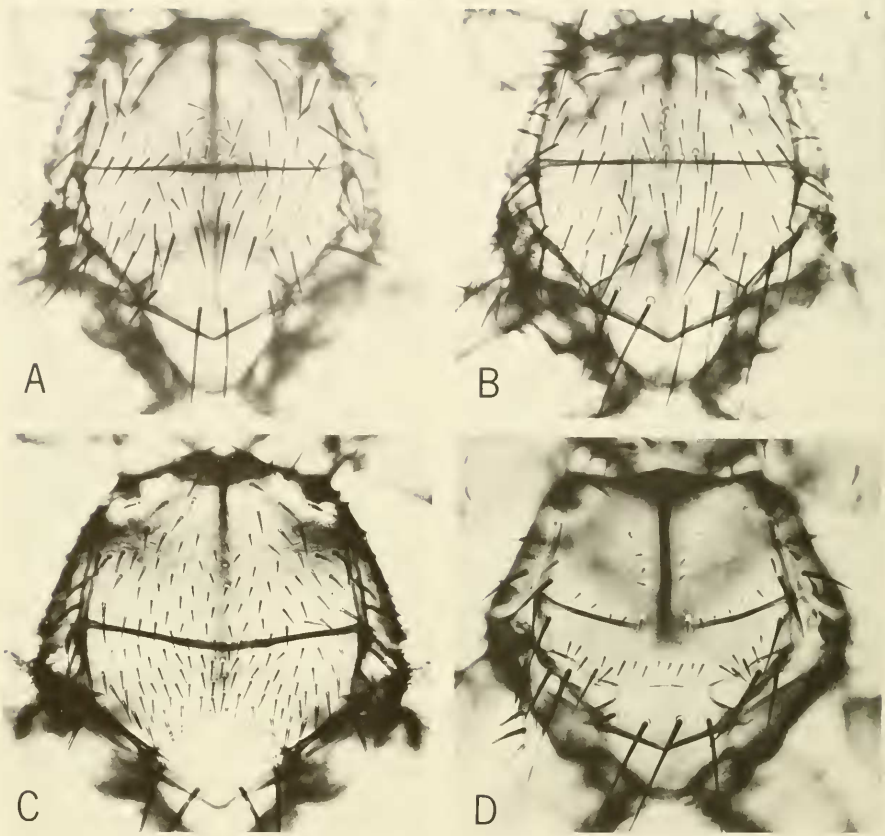

Fig. 29. Thorax, dorsal view, of species (A-C) of the *Trichobius phyllostomae* group and (D) the Genus *Trichobioides*. A, *Trichobius petersoni*, new species (female allotype); B, *Trichobius hispidus*, new species (female allotype); C, *Trichobius vampyropis* Wenzel (female allotype); D, *Trichobioides perspicillatus* (Pessôa and Galvão), male. C-D from Wenzel et al. (1966).

Vampyrops vittatus, the host from which the type was collected in Panama.

Trichobius petersoni, new species
(Fig. 28I, 29A)

Trichobius petersoni n. sp., and the following new species, *T. hispidus* differ from all other species of the *phyllostomae* group in having greatly elongated hindlegs and short forelegs, thus resembling species of *Speiseria* and *Paratrichobius*. Differences between the two species are summarized under *T. hispidus*.

Description

In general, closely resembling species of *Speiseria*. *Head*. Subquadrate, dorsal aspect very similar to that species of *Speiseria* and *Paratrichobius*. Eyes large, conspicuous, with 25-57 facets, their length equal to or slightly greater than maximum width of a laterovertex, each of the latter with 6 coarse strong setae (one of them a long macrosetae) and 1 short stout setae along anterior margin. Each occipital lobe with about 5 shorter stout setae along outer and posterior margin and 6 other long setae, 2 of them unusually long macrosetae that are nearly

as long as head is wide; longer setae inserted on distinct tubercles; inner portion of each lobe rather narrow. Palpi feebly transverse, subovate, their inner anterior margin oblique; undersurface setose but the outer apical fourth bare except for a strong ventrally directed seta near margin. Theca transverse, sides arcuate and subparallel on basal half, then converging to apex; distinctly broader than long, with numerous setae on a little more than apical half and a couple of pairs along basal margin. Oral cavity broad, posterior margin rounded; numerous scattered, erect and semierect setae, mostly short but of varying lengths, behind oral cavity.

Thorax. Anterior margin rather strongly projecting and bilobed, somewhat emarginate on each side for reception of the occipital lobes of the head; median suture present on about apical half; transverse suture straight, a little wider and less distinct along midthird or slightly more. Prescutum with strong setae along anterior margin, these becoming longer at anterior angles and posteriorly and along sides, those in front of transverse suture becoming gradually finer and shorter medially, and only slightly longer than a short median discal seta; setae lacking on each side of median suture. Discal scutal setae slightly shorter than the prescutal setae immediately in front of transverse suture, becoming slightly longer posteriorly, some of them conspicuously longer immediately in front of the antescutellar row; the 8-10 setae of this row quite long, the median ones extending to about midlength of scutellum; 5 macrosetae along lateral margin, 1 of them nearly as long as scutellum is wide; outer pair of scutellar setae only about half as long as the median pair. Mesosternum strongly projecting between the front coxae, anterior margin subtruncate, very deeply emarginate. Metasternal lobe long, rather slender, pointed, reflexed dorsally, and extending half or more of the distance to metepimeron.

Wings. Without distinctive characters. *Legs.* Prolegs short, femora stout; outer face of profemora with numerous fine, rather short setae, these becoming longer along outer dorsal edge, which has a row of 7-8 conspicuously longer setae; dorsal surface with 2 rows of long coarser setae, an outer one of 4, the apical one much more slender, and an inner diagonal row of about 4; inner face with very minute setae except distally near lower margin where there are numerous, longer, though short setae and 1 very strong curved apical seta. Midlegs longer and more elongate than forelegs; midfemora with fine, short, recumbent setae on inner face, those along inner ventral margin distinctly longer and stronger; outer face with many short and long setae, many of them macrosetae, the longest ones being along inner dorsal margin on about apical half; outer ventral margin with numerous long setae. Hindlegs greatly elongated, nearly twice as long as forelegs; hindfemora clothed with very short recumbent setae on inner face; with longer, though short setae on outer face; 4 or 5 long setae, some of them macrosetae, along inner dorsal margin on basal half and about 4 much longer setae; 4 long setae on about apical ⅔ of outer edge of upper margin, 3 of these very conspicuous macrosetae, that are as long as or longer than maximum width of femur; underside of femur at base with a cluster of long setae, followed by a row of long setae along lower outer margin. Last segment of tarsus about twice as broad as preceding tarsomeres.

Abdomen. Each lateral lobe of tergum 1+2 with ±6 rather short, very slender setae along inner margin on each side; apical and lateroventral margins with a strong cluster of ±18 setae, about 6 or 7 of these much shorter though stout, the other macrosetae including a couple of conspicuously longer ones. Sternum 2 relatively narrow with typical triangular setose area, most of the setae rather heavy and fairly short, a few of them finer, those along posterior margin at middle, more slender, two of them especially so, becoming heavier toward lateral angle. Female. Lateral connexival setae short, but including a cluster of 4 or 5 stronger setae on each side behind lateral lobes of tergum 1+2, these from 1 to 3 times as long as the other setae; ventral connexival setae similar to the lateral ones, though slightly longer, especially a transverse group of conspicuously longer setae near apex. Tergum 7 very short and broad, rather arcuate, a long macroseta near each outer edge —these longer than the macrosetae of supra-anal plate—and a pair of very short fine setae medial to these. Supra-anal plate, in addition to the 4 apical macrosetae, with 2 short setae along each lateral margin and 2 widely spaced ones anterior to the 2 medial macrosetae. Seventh sternites small, oval, transverse, with ±6 setae distally, these about as long as apical connexival setae, followed by about 3 longer setae on inner half, 4 or 5 conspicuously longer setae along distal margin, and 1 extremely long, very heavy macroseta. Male. Fifth sternum well developed, broad, apical margin feebly emarginate; disc clothed with setae similar to those of the connexivum anterior to them; apical margin, on about middle third, with 5-6 long slender setae, these about twice as long as the longer discal

setae, and, on each side, a row of 3-4 very long macrosetae of which 2 are usually conspicuously longer than the others. Sternum 7+8 with 2 short setae and 1 very long macroseta. Tergum 9 with ± 12 setae, of which the most ventral 4-5 are rather short, most of the others being long, conspicuous macrosetae; in some specimens the most dorsomedial setae of tergum 9, while they may be very long, are conspicuously shorter than the other macrosetae. Male postgonites distinctly bent a little beyond middle, the left one broader than the right one, dorsal margin of both distinctly sinuate before apex; ventral macroseta of right postgonite inserted just beyond the bend, the accessory seta inserted just distal to it, this inserted more distad on the left postgonite, which has several denticlelike setae distal to the accessory seta, these lacking on the right postgonite; both postgonites with a couple of widely spaced sensillae on dorsal margin, one along the dorsal bend, the other along the sinuation, and, also, a subapical dorsal sensilla and several minute distal sensillae; aedeagus very slender and pointed distally, widened and troughlike basally.

MEASUREMENTS

	Males	Females
BL	1.75-2.13	1.62-2.30
TL	0.67-0.76	0.71-0.83
WL	2.04-2.28	2.05-2.49
WW	0.82-0.96	0.67-1.01

TYPE DATA

Male holotype, female allotype, and 1 male and 1 female paratype ex *Sturnira bogotensis* (CJM 13139), Colombia, Cundinamarca, Bogota, X-68, C. J. Marinkelle. All in the collection of Field Museum of Natural History. PARATYPES—VENEZUELA. MÉRIDA: 1 male ex *Sturnira bogotensis*, 4 km E Tabay, La Mucuy, Tabay, 2,107 m, 8-III-66; 8 males and 4 females ex *Sturnira erythromos*, 12 km SE La Azulita, La Carbonera, 2,150-2,180 m, 21-23-IV-66; 1 male and 2 females, same host, 6 km SE La Azulita, La Carbonera, 1,870 m, 23-IV-66. MONAGAS: 2 females ex *Sturnira erythromos*, 3 km NW Caripe, nr. San Agustín, 1,345 m, 11-VII-67. Zulia: 1 male ex *Sturnira erythromos*, 19 km WSW Machinques, Novito, 1,135 m, 2-V-68.

Trichobius hispidus, new species

(Fig. 28G, H; 29B)

Closely resembling *Trichobius petersoni* n. sp., but differing markedly from that species as well as others of the group by its conspicuous long setae on the dorsal connexivum on each side of the bare median area, as well as in having more numerous eye facets (± 36 as opposed to 25-27), more numerous setae on the occipital lobes, a longer theca, entirely different male postgonites, and other differences cited in the key.

Like *T. petersoni, hispidus* differs from all other species of the group in having greatly elongated hindlegs and short forelegs, these conspicuously shorter than midlegs. Both these species and *T. vampyropis* differ further from *brennani* and *phyllostomae* in having a more elongate thorax and more strongly projecting anterior prescutal margin.

DESCRIPTION

Head. Similar to that of *petersoni* but a little narrower, not as flattened, and with lateral portion of occipital lobes not as strongly projecting posteriorly. Eyes larger, with ±36 facets; longer, viewed from above, than greatest width of a laterovertex. Each laterovertex with 6 strong macrosetae, and a minute seta along anterior margin. Occipital lobes each with about 9 setae and 1 or 2 minute setae below posterior margin. Palpi elongate-oval, ventral surface bare on ±apical third.

Thorax. More elongate, less quadrate than in *petersoni*, anterior margin of mesonotum usually rather strongly arcuately projecting at middle, distinctly but not strongly emarginate on each side of the projection. Chaetotaxy of mesonotum very similar to that of *petersoni*, but most setae slenderer, and the shorter medial setae of prescutum and scutum, especially, are distinctly longer than in that species.

Wings. Without distinctive characters. *Legs.* Very similar in size and chaetotaxy to those of *petersoni*, but mid- and hindfemora with longer and more numerous long setae.

Abdomen. Lateral lobes of tergum 1+2 each with 16-18 setae, most of them conspicuous long macrosetae, especially along posterior margin; inner margin of lobes with ±5 shorter, very thin setae. Sternum 2 with strong setae, most of those on apical margin at least a third longer than the discal setae, ±4 of them conspicuously longer macrosetae. Lateral setose area of dorsal connexivum with conspicuous slender macrosetae, generally arranged in transverse rows, or clusters, of 2-5 each, including a group behind lateral lobes of tergum 1+2, usually a group per segment on each side, with shorter setae intermingled, these generally distinctly longer than those along lateral margins; the long setae less numerous in the males. Ventral connexivum in both sexes with setae of about the same

length as the discal setae of sternum 2 but more slender, and with the usual segmentally disposed (2 pairs per segment) longer, slender setae. Female. Tergum 7 transverse, striplike, i.e., short and wide, not united with supra-anal plate, with a pair of long macrosetae (these as long or longer than the 4 distal macrosetae of supra-anal plate), one on each side, and medial to each of these a slender seta that is about one-third as long. Seventh sternites small, at least as long as broad, their posterior margin rounded, sides converging apically to a blunt point; with 15-17 setae, including 7-8 short anterior ones, 1 conspicuously longer distal macroseta, and 1 shorter macroseta, the others of intermediate lengths. Male. Sternum 5 shorter than in *petersoni;* discal setae similar to ventral connexival setae; apical and lateral margins with conspicuously longer setae, 8-10 of them very long macrosetae of which 1-2 pairs on each side may be unusually long. Sternum 6 absent. Sternum 7+8 with 1-2 macrosetae (1 conspicuously longer) and 1-2 shorter setae. Tergum 9 on each side with about 10 slender macrosetae and 8-9 shorter setae, about 5 of these situated anteroventrally. Postgonites short, asymmetrical; basally very broad (in lateral profile; the macrosetae and accessory setae inserted on a projection, at approximately the same location on both gonites; accessory seta long and strong, about half length of macroseta, or slightly longer; right postgonite suddenly narrowed and relatively slender, its dorsal margin nearly straight from this point, the ventral margin curved, with 4 or 5 short setae at the orifices of long, oblique, internal trabeculae, other trabeculae (without visible setae) situated distal to these and at apex; left postgonite broad, bladelike (in lateral view), strongly curved dorsally beyond level of insertion of ventral setae, ventrally with a submarginal row of 4 or 5 sensillae and thornlike projections inserted in the orifices of long, oblique, internal trabeculae, other trabeculae distal to these, some extending inwardly from dorsal margin. Aedeagus relatively short, slender, and pointed apically, widened but not troughlike basally.

Measurements

	Males	Females
BL	2.05-2.26	2.24-2.50
TL	0.78-0.81	0.82-0.86
WL	2.30-2.49	2.58-2.69
WW	0.90-1.04	0.96-1.13

Type Data

Male holotype ex *Sturnira bidens* (SVP 4372) and female allotype, same host (SVP 4368), Venezuela, Mérida, 6 km ESE Tabay, Middle Refugio, Tabay, 2,550 m, 6-IV-66. Paratypes—Mérida: 3 males and 3 females ex *Sturnira bidens*, 4 males and 2 females ex 1 *Sturnira*, same data as holotype but 2,550-2,640 m, 6-15-IV-66.

Xenotrichobius, new genus

Type Species: *Xenotrichobius noctilionis* n. sp.

Diagnosis

Head. Superficially resembling that of species of the *Trichobius major* and *caecus* groups. Occipital lobes nearly vertical as in *T. sparsus,* but separated from the laterovertices. Palpi elongate-oval, without ventral setae, except one submarginal one; marginal setae, including apical macrosetae, present.

Thorax. Convex, as deep as wide. Notopleural suture and episternal cleft open, membranous. Mesonotum with typical median and transverse sutures. *Wings.* Vein 5 not extending beyond *r-m* but continuous with it in an even arc which unites with vein 4 just before wing apex. *Legs* elongated, subequal, fore-, mid-, and hindlegs successively slightly longer. Dorsal surface of pro- and metatibiae with rather long semierect setae in rows, the metatibiae with at least several conspicuously longer macrosetae.

Abdomen. Female. Tergum 7 transversely oval, supra-anal plate and ventral arc greatly reduced, all of them feebly sclerotized, the supra-anal plate lacking distal macrosetae. *Male.* Sternum 5 absent, 6 and 7+8 not recognizable; 7+8 may be united with tergum 9 to form the compact hypopygium, but there is no evident suture or other demarcation. Venter with a large, setose cone which arises somewhat anterior to base of hypopygium and projects posteriorly far beyond it. Genitalia complex. Postgonites very thin walled, translucent, much attenuated apically in profile. Aedeagus narrow, ribbonlike, and "coiled" basally; situated within a heavy pouchlike sheath, which apparently is attached to the hypandrium; basal region of the sheath covered on each side with dense, short bristles inserted on translucent plaques; distally the sheath is lightly sclerotized and bilobed, both dorsally and ventrally, the lobes resembling gonites, especially the ventral ones, whose chaetotaxy is also similar.

Discussion

The female of the type species is remarkably similar to those of many species of *Trichobius,* but differs from any of them in the great

reduction of the supra-anal plate, in possessing macrosetae on the hind tibiae, and in the unique nature of the wing vein 5. The male, however, is unlike any known streblid, not only in having the peculiar heavily sclerotized ventroapical cone, but also in the complex genitalia. Unfortunately, the condition of the postabdomen of the unique male, including the genitalia, makes interpretation very difficult.

Xenotrichobius noctilionis, new species
(Fig. 30)

DESCRIPTION

Head. Eyes with 9 large facets. Laterovertices and occipital lobes separated, but the lobes nearly vertical. Each laterovertex with 6-7 setae, including a very strong, long, median macroseta and several shorter, strong setae, the others very short. Occipital lobes each with ± 7 setae, including 2 very long macrosetae which are nearly as long as head is wide, 5 other strong setae, including macrosetae of varying lengths, and 2 or more very short setae along posterior margin. Theca distinctly longer than broad, sides arcuate and convergent, labella as long as theca, which has 1 very long slender seta and 1 shorter one posterior to it on each side near apex, 2 strong, rather long discal setae shortly behind these, 1 on each side of median line, and 4 minute setae in a transverse row along base.

Thorax. Anterior margin subtruncate, feebly arcuate. Mesonotum very sparsely setose. Prescutum on each side with ± 9 slender macrosetae—4 of these along lateral margin, 2 on each side in front of transverse suture, 3 in an irregular row extending posteriorly from near apex to slightly beyond middle—and a pair of setae at middle in front of transverse suture, these of variable length, sometimes being slender macrosetae, sometimes short; in addition to these there may be from 2-5 shorter setae near transverse suture and the lateral macrosetae. Scutum with 3 macrosetae and 3 much shorter setae along lateral margins; 2-7 (!) fairly long slender setae in front of scutellum, and 14-15 much shorter ones between these and/or anterior to them on disc. Scutellum with 4 macrosetae, the medial pair longer. Anterior margin of mesosternum pointed between the coxae and bent upward. Metasternal lobe absent. Underside sparsely setose, the setae of mesosternum becoming longer laterally; metasternal setae slightly shorter than those on mesosternum.

Wings. With a fairly long seta at apex of vein 3; setae lacking on underside of veins except on apical fourth of wing; without other distinctive characters, excepting those mentioned in the generic diagnosis.

Legs. Profemora with numerous erect and semierect setae, including 8-10 macrosetae along dorsal edge; 12-13 of the setae along ventral margin very long and erect, those along outer face shorter and erect or semierect; inner face with a few minute, sparse setae which become longer and more noticeable toward apex. Protibiae clothed with moderately short, semierect

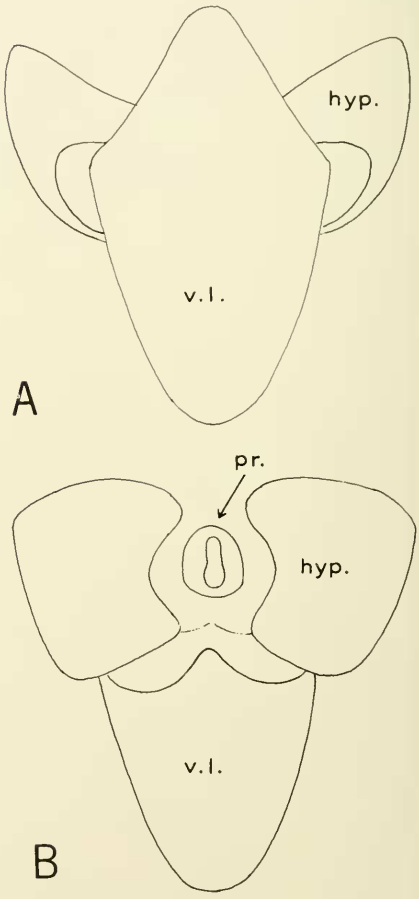

Fig. 30. *Xenotrichobius noctilionis*, new genus, new species (holotype), apex of male abdomen: A, dorsal, and B, ventral, views (setae omitted). *hyp.* = hypopygium (sterna 7+8); *pr.* = proctiger; *v.l.* = ventral lobe.

setae; dorsal margin with a row of about 10 conspicuously longer ones, these about as long as maximum width of tibia; setae becoming much shorter ventrally and apically, the ventral ones microsetae except at apex. Midfemora with ± 4 dorsal macrosetae, a couple of shorter strong setae near apex, and a couple of others on each side near apex; sparse conspicuous setae along lateral face and ventral edge, most of them erect or semierect, a few conspicuously longer ones on apical third or slightly more. Mesotibial chaetotaxy similar to that of protibiae except that the dorsal setae are conspicuously shorter. Hindfemora with a mixture of short to long setae along dorsal surface including 8-9 macroseta, most of these on distal half; lateral face with similar short setae on basal half, and a mixture of short and longer setae on distal half, 7 or 8 of these long macrosetae. Hindtibiae similar to mesotibiae except that the dorsal edge has a submarginal row of setae that are longer than those on the lateral face, and a median row of about 6-8 conspicuous ones, 3-4 of them macrosetae that are distinctly longer than maximum width of tibiae.

Abdomen. Lateral lobes of tergum 1+2 with 18-19 strong setae, including macrosetae, in the female, and ± 24 in the male, some of them longer than in the female. Sternum 2 with sparse setae of about the same length as those on the mesosternum, those in lateral angles distinctly longer. Female. Tergum 7 roundly oval, transverse, with 2-3 short setae on each side; as broad as the inconspicuous, lightly sclerotized, supra-anal plate, which lacks distal macrosetae (!), but has 1-2 short setae along each lateral margin. Dorsolateral connexivum with minute setae, excepting 1 or 2 clusters of longer setae around 7th spiracle; ventral connexival setae short, but stronger than those on sides and dorsum, with conspicuously longer, slender setae intermingled distally. Seventh sternites suborbicular, outer margin oblique; each with ± 19 setae, those along inner margin very short, the others of varying lengths including 4-5 conspicuously longer macrosetae. Male. Dorsolateral connexival setae short, but much longer than in the female, and very dense; distally the setose area extends nearly across apex; ventral connexival setae shorter and sparser, especially along middle. Sternum 6 not discernable; sterna 7+8 presumably fused with tergum 9 to form the hypopygium, which is covered with numerous short setae, with a few conspicuously longer setae along inner margin and ventrally, 1-2 of these rather slender, but not unusually long, macrosetae. On venter near base of hypopygium is a large (0.3 mm long) cone which extends far beyond the hypopygium; cone with minute setae dorsally, sides with longer setae which become dense, long macrosetae at apex like the dorsal setae; underside of cone with slender setae.

Measurements

	Males	Females
BL	3.22	3.00-3.01
TL	0.97	1.01-1.05
WL	2.18	2.48-2.50
WW	1.01	0.98-1.00

Type Data: Holotype male ex *Noctilio leporinus* (FMNH) 93205), Surinam, Kaiserberg airstrip, east of Zuid River, 900 ft, 12-X-60, H. A. Beatty (FMNH Guianan Zool. Exped. 1960-61). Paratypes—VENEZUELA. Apure: 1 female (IZUCV) ex *Noctilio labialis* (SVP 5719), 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 17-XII-65. T. F. Amazonas: 1 female (USNM) ex *Noctilio leporinus* (SVP 15678), 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 12-I-67.

Genus *Anatrichobius* Wenzel

Anatrichobius Wenzel, 1966:502

Type Species: *Anatrichobius scorzai* Wenzel, 1966:503

Anatrichobius scorzai Wenzel

(Fig. 31, 32)

Anatrichobius scorzai Wenzel, 1966:503, Fig. 76-78

Venezuelan Survey Records (11 males, 3 females)

BARINAS: 1 male ex 1 *Lonchophylla robusta*, 2 km SW Altamira, Altamira, 620 m, 26-XII-67.

BOLÍVAR: 1 male ex *Myotis oxyotus*, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 3-V-68; 1 female, same host, 85 km SSE El Dorado, Km 125, 826 m, 16-V-66.

CARABOBO: 3 males ex *Myotis keaysi*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 28-XI-67.

DTO. FEDERAL: 1 female ex *Myotis keaysi*, 4 km NNW Caracas, Los Venados, 1,400 m, 1-VIII-65.

MIRANDA: 1 male ex *Myotis oxyotus*, 33 km WSW Caracas, Alto Ño Léon, 1,950 m, 27-V-67; 5 males and 1 female ex *Myotis keaysi*, 5 km NNW Guarenas, Curapao, 1,160 m, 5-X-66.

Fig. 31. *Anatrichobius scorzai* Wenzel, female: dorsal view and right wing. From Wenzel et al. (1966).

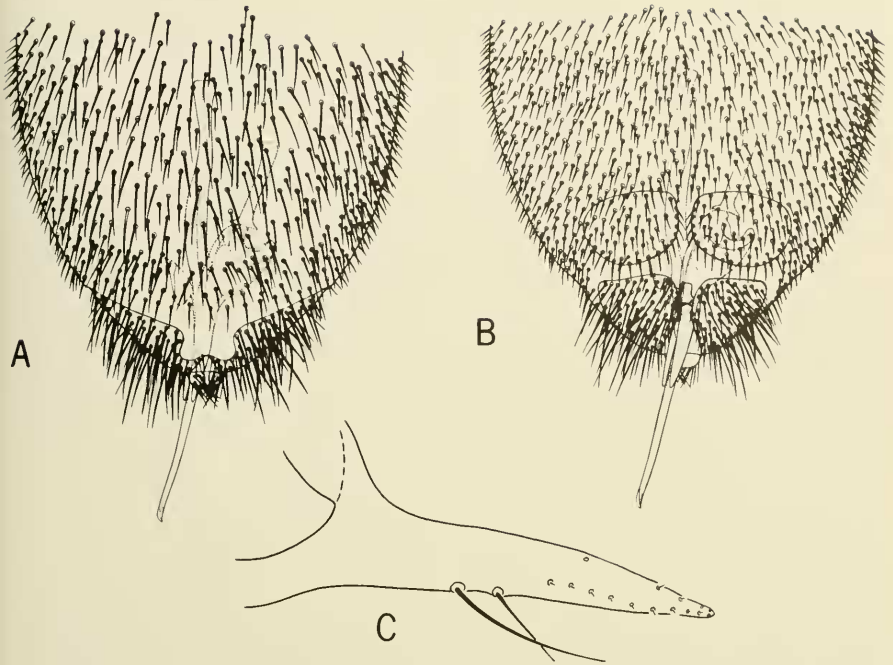

Fig. 32. *Anatrichobius scorzai* Wenzel, male: A, dorsal, and B, ventral, view of apex of abdomen; C, left postgonite. From Wenzel et al. (1966).

Other Material Examined

COSTA RICA: 10 males and 7 females ex 4 *Myotis keaysi*, 3 males and 2 females ex 2 *Myotis nigricans*, 5 males and 3 females ex 1 *Myotis oxyotus* and 1 female ex 1 *Myotis* sp. (probably "*nigricans*"), Puntarenas, Monteverde, 1,400 m, various dates, 1973-74, R. K. LaVal.

HONDURAS: 1 male and 1 female ex *Myotis keaysi*, Francisco Morazan, 11 km W Morazan, 26-VII-69, R. K. LaVal.

Host Associations

The holotype of *Anatrichobius scorzai* was reported from *Myotis* sp. (Panama). The original series included specimens from: Panama, ex *Myotis nigricans* and *M. chiloensis* (= *oxyotus*); Venezuela, ex *M. nigricans;* Colombia, ex *M. nigricans;* and Peru, ex *M. chiloensis oxyotus*. Dr. Richard LaVal has restudied many of the host specimens on which these records are based and has informed me (pers. comm.) that most of the original identifications were incorrect. He determined the hosts of the Venezuelan specimens as *M. keaysi*, the hosts of all the Panamanian specimens (and thus, also of the type) taken from the cave at Cerro Punta, Chiriqui, as *M. oxyotus*, and of the Peruvian specimens as *M. oxyotus*. Some bats taken at a slightly lower elevation at Cerro Punta were *M. keaysi*, and thus some paratypes may be from that host. LaVal did not examine the hosts of the Colombian paratypes but stated (loc. cit.) "that from 2,350 meters they probably are either *keaysi* or *oxyotus* and not likely to be *nigricans*."

Thus it would appear that the characteristic hosts of *A. scorzai* are *M. keaysi* and *M. oxyotus*. According to LaVal (loc. cit.), "It is perhaps not surprising that *keaysi* and *oxyotus* share the same parasites . . . since they are both cave bats, and both live in wet mountain forests." Its known distribution now includes Honduras, Costa Rica, Panama, Colombia, Peru, and Venezuela.

In Costa Rica (Puntarenas, Monteverde,

1,400 m, 12-VIII-73 and 8-XII-73) LaVal also collected specimens of the related *Joblingia schmidti* together with *A. scorzai* on both *M. keaysi* and *M. nigricans*. The type of *J. schmidti*, from Guatemala, was reported (Wenzel and Dybas, 1947) as being from *Myotis velifer*. LaVal has reexamined the series of bats from which the type of *schmidti* was taken and found them to be *M. keaysi*. Wenzel et al. (1966:509) reported *J. schmidti* from *M. nigricans* and *M. chiloensis* from Panama. LaVal has reidentified all of these bats as *M. oxyotus* (= *chiloensis*).

Genus *Trichobioides* Wenzel

Trichobioides Wenzel, 1966:510

TYPE SPECIES: *Trichobius perspicillatus* Pessôa and Galvão, 1937:1

Trichobioides perspicillatus (Pessôa and Galvão)

Trichobius perspicillatus Pessôa and Galvão, 1938:1, Fig. 1-3 (see no. p. 225)

Trichobioides perspicillatus, Wenzel, Tipton, and Kiewlicz, 1966:511, Fig. 81, 82A.

VENEZUELAN MATERIAL EXAMINED (408 males, 273 females, 8 sex undet.)

This characteristic parasite of *Phyllostomus discolor* was collected wherever that host occurred. It was taken at 30 localities in 12 states as follows: Aragua (1 locality), Barinas (1 locality, 611-620 m), Bolívar (2 localities, 150-306 m), Carabobo (2 localities, 60-598 m), Dto. Federal (1 locality, 380 m), Falcón (4 localities, 25-480 m), Guárico (1 locality, 630 m), Miranda (3 localities, 1-60 m), Monagas (2 localities, 18-1,165 m), Sucre (3 localities, 1-380 m), T. F. Amazonas (4 localities, 140-195 m), Trujillo (1 locality, 90 m), Zulia (7 localities, 24-270 m).

HOST ASSOCIATIONS

Of 689 specimens of *Trichobioides perspicillatus* collected by the survey teams, 668 (97 percent) were from *Phyllostomus discolor*, and the remaining 21 specimens were from 9 other bats of 5 species. While most of these other records probably represent transitory associations or contaminations, several appear to have resulted from mislabeling or misinterpretation of field numbers in the laboratory, namely those from *Carollia perspicillata, Artibeus jamaicensis, Glossophaga longirostris, Eumops glaucinus*, and *Sturnira lilium*. Interestingly, this fly was never taken from *Phyllostomus elongatus*, though *Strebla consocius*, another characteristic parasite of *Phyllostomus discolor*, was commonly found on that host.

Genus *Paratrichobius* Lima

Paratrichobius Lima, 1921:20

TYPE SPECIES: *Trichobius longicrus* Ribeiro, 1907:236

This genus is taxonomically very complex (Wenzel et al., 1966: 519 pp.). I believe it will be possible to revise or partially revise the species only when a significant amount of additional material with reliable host associations has accumulated.

Provisional Key to the Venezuelan Species of *Paratrichobius*

1. Inner face of profemora with only 2 or 3 short spinlets and/or setae medial and parallel to posterior end of oblique row of spines or heavy setae (Fig. 34A, 35A) 2
   Inner face of profemora with a complete row of setae medial and parallel to the oblique row of spines or strong setae (Fig. 33A, 35B) 3

2. Mesonotal chaetotaxy as in Fig. 34A. MALE. Inner ventroapical margins of hypopygium with spinelike setae (Fig. 37A). Hosts: species of *Uroderma* ..... *dunni* Curran
   Mesonotal chaetotaxy as in Fig. 35A. MALE. Inner ventroapical margins of hypopygium with normal setae as in *Paratrichobius longicrus* (Fig. 37B). Hosts: species of *Chiroderma, Vampyressa, Vampyrodes, Vampyrops* ..... *salvini* complex

3. Inner face of profemora with 7 spines or stout setae in a diagonal row. Hindfemora shorter, rarely as long as 1.26 mm 4
   Inner face of profemora with 6 stout spines. Hindfemora longer, 1.32-1.77 mm long ..... *longicrus* complex

4. Inner face of profemora with stout spines. MALE. Inner ventroapical margins of hypopygium with normal setae. Host: *Artibeus hartii* ..... *sanchezi* Wenzel
   Inner face of profemora with a diagonal row of strong setae, not spines. Mesonotal chaetotaxy as in Fig. 35B. MALE. Inner ventroapical margins of hypopygium with stout spinelike setae as in *dunni*. Host: *Artibeus cinereus* and *A. watsoni* ..... *lowei* Wenzel

Paratrichobius lowei Wenzel
(Fig. 35B)

Paratrichobius lowei Wenzel, 1966:528, Fig. 92B, 93

Venezuelan Survey Records (8 males, 4 females)

BOLÍVAR: 8 males and 4 females ex 9 *Artibeus cinereus*, 85 km SSE El Dorado, Km 125, 826-1,032 m, 12-19-V-66.

Remarks

The type and paratypes of *Paratrichobius lowei* were taken from *Artibeus watsoni* in Panama.

Paratrichobius sanchezi Wenzel

Paratrichobius sanchezi Wenzel, 1966:530, Fig. 92C, 94

Venezuelan Survey Records (43 males, 28 females ex *Artibeus hartii*)

CARABOBO: 2 females, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 6-7-VIII-68.

DTO. FEDERAL: 11 males and 11 females, 4 km NNW Caracas, Los Venados, 1,400-1,559 m, 21-VII–15-VIII-65; 22 males and 12 females, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,092-2,240 m, 20-VIII–27-IX-65; 8 males and 1 female, 6 km NNW Caracas, nr. Boca Tigre, Pico Ávila, 1,982-2,013 m, 24-30-VIII-65.

GUÁRICO: 1 female, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66.

MONAGAS: 1 female, 5 km NW Caripe, San Agustín, 1,160 m, 6-VII-67.

ZULIA: 2 males, 19 km WSW Machiques, Novito, 1,135 m, 4-V-68.

Remarks

The holotype, allotype, and 1 paratype were taken from *Artibeus hartii* in Panama, as were a series of paratypes from the Biological Station at Rancho Grande in Venezuela.

Paratrichobius dunni (Curran)
(Fig. 34, 37A)

Speiseria dunni Curran, 1935:7, Fig. 6

Paratrichobius dunni Wenzel, Tipton, and Kiewlicz, 1966:527, Fig. 90, 91A, 92A

Venezuelan Survey Records (61 males, 40 females, 1 sex undet.)

APURE: 1 male ex *Uroderma magnirostrum*, 5 males and 2 females ex *Uroderma bilobatum*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 29-I–6-II-68.

BARINAS: 13 males and 6 females ex *Uroderma bilobatum*, 2 km SW Altamira, Altamira, 609-620 m, 26-XII-67–5-I-68; 1 female, same host, Altamira, 794 m, 21-XII-67.

BOLÍVAR: 1 male and 2 females ex *Uroderma bilobatum*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-20-VI-66; 2 males and 1 female, same host, 45 km NE Icabarú, Santa Lucía de Surukun, Icabarú, 851 m, 29-IV-68.

DTO. FEDERAL: 1 male ex *Uroderma bilobatum*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 19-VIII-66.

FALCÓN: 1 sex undet. ex *Uroderma magnirostrum*, 2 males and 1 female ex *Uroderma bilobatum*, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 23-IX–4-X-65; 1 male and 2 females, same host, 14 km ENE Mirimire, nr. La Pastora, 60-122 m, 21-27-XI-67; 2 males and 1 female, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-29-XI-67.

MIRANDA: 1 male and 1 female ex *Uroderma bilobatum*, 1 km S Río Chico, 1 m, 25-X–2-XI-66; 5 males and 1 female, same host, Birongo, 60 m, 21-23-I-68.

SUCRE: 2 males ex *Uroderma bilobatum*, 9 km NE Güiria, Ensenada Cauranta, 7 m, 13-VI-67.

T. F. AMAZONAS: 1 male ex 1 *Desmodus rotundus*, 1 male and 3 females ex *Uroderma magnirostrum*, 1 male and 1 female ex *Uroderma bilobatum*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 11-27-VII-67; 1 male ex *Uroderma magnirostrum*, Río Orinoco, Tamatama, 135 m, 28-IV-67; 4 males ex *Uroderma bilobatum*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 6-I–3-II-67; 1 male, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 8-X-67; 2 males, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 14-IV-67.

TRUJILLO: 2 females ex *Uroderma bilobatum*, 46 km WNW Valera, La Ceiba, 29 m, 28-X-65; 1 female, same host, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 6-X-65.

YARACUY: 1 male and 2 females ex *Uroderma bilobatum*, 10 km NW Urama, El Central, Urama, 25 m, 14-21-III-66; 1 male and 2 females, same host, 11 km NW Urama, El Central, Urama, 25 m, 22-III-66.

ZULIA: 1 male ex *Uroderma magnirostrum*, 1 female ex *Uroderma bilobatum*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III–1-IV-68; 5 males and 5 females, same host, 1 male ex *Uroderma magnirostrum*, 42 km WNW Encontrados, El Rosario, 24 m, 3-III–5-V-68; 1 male and 2 females ex *Uroderma bilobatum*, 48 km WNW Encontrados, El Rosario, 54 m, 24-27-II-68; 2 males and 1 female, same host, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 18-19-III-68; 1 male, same host, 63 km WNW Encontrados, La Rinconada, El

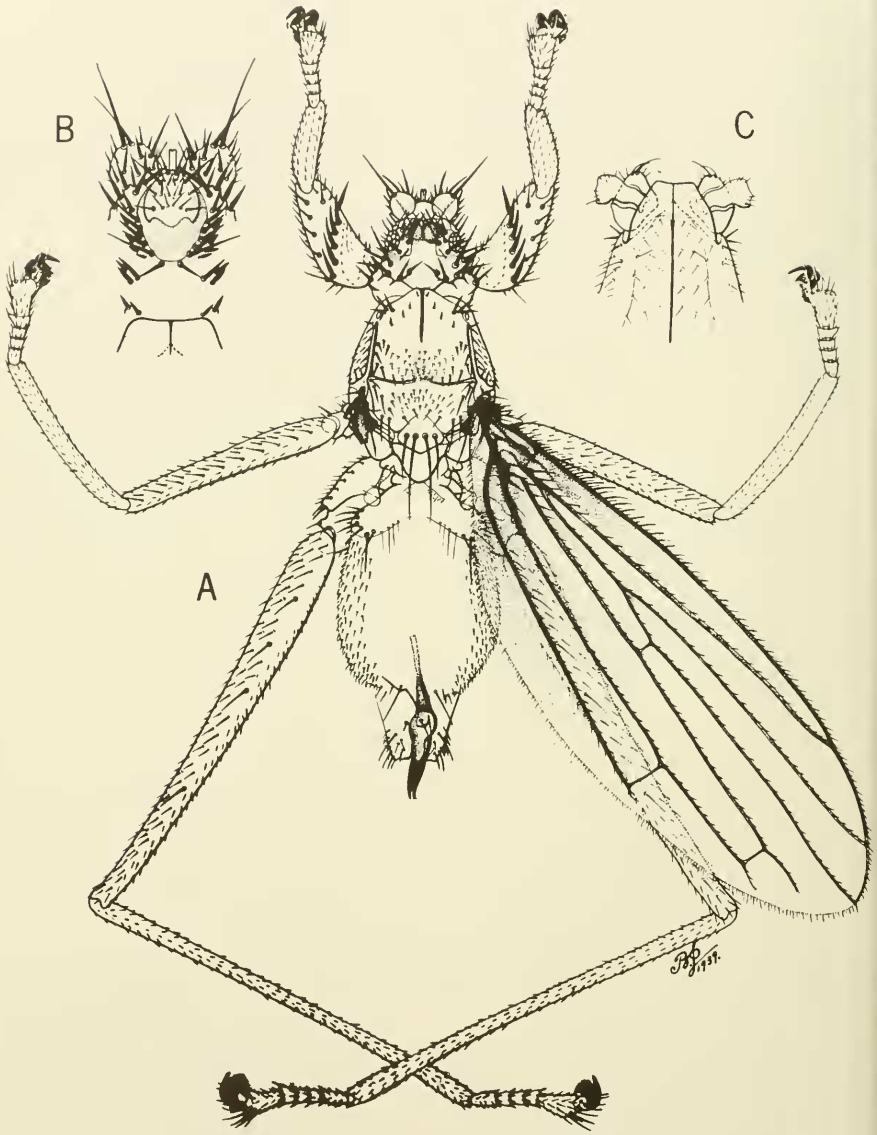

Fig. 33. *Paratrichobius longicrus* Ribeiro, dorsal view. From Jobling (1939).

Rosario, 125 m, 28-II-68; 2 females, same host, 21 km SW Machiques, Kasmera, 270 m, 17-IV-68; 1 male, same host, 33 km NW La Paz, nr. Cerro Azul, 75 m, 15-VI-68.

Paratrichobius salvini Wenzel
(Fig. 35A)

Paratrichobius salvini Wenzel, 1966:532, Fig. 95, 95C

Only specimens taken from *Chiroderma salvini* are recorded here as *Paratrichobius salvini*. Specimens from several other hosts are extraordinarily similar, but most of them exhibit differences that correlate with host species in absolute and relative length of wings and hindlegs and in some other character states. Some may be *salvini*; some are the entities recorded by Wenzel et al. (op. cit., p. 535) as *Paratrichobius* species A and B. The collections at hand appear to be inadequate to characterize these populations.

Venezuelan Survey Records (5 males ex *Chiroderma salvini*)

CARABOBO: 1 male, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 29-XI-67.

DTO. FEDERAL: 2 males, 6 km NNW Caracas, nr. Boca Tigre, Pico Ávila, 2,118-2,119 m, 30-VIII-65.

MIRANDA: 1 male, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 23-IX-66.

MONAGAS: 1 male, 5 km NW Caripe, San Agustín, 1,165 m, 28-VI-67.

Paratrichobius species (*salvini* complex)

Venezuelan Survey Records (51 males, 24 females, 2 sex undet.)

APURE: 4 males ex *Vampyrops helleri*, 1 female ex *Chiroderma villosum*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 17-I—6-II-68.

BARINAS: 13 males, 10 females, and 2 sex undet. ex *Vampyrops helleri*, 2 km SW Altamira, Altamira, 611-619 m, 31-XII-67—2-II-68; 4 males and 1 female, same host, 1 male ex *Chiroderma trinitatum*, Altamira, 794 m, 19-21-XII-67.

CARABOBO: 1 male and 2 females ex *Vampyrops helleri*, 4 km NW Montalbán, 1,537 m, 27-29-XI-67; 1 male, same host, 3 km SW Montalbán, Hda. La Canada, Montalbán, 618 m, 22-XI-67.

FALCÓN: 1 male ex *Vampyrops helleri*, 14 km ENE Mirimire, nr. La Pastora, 122 m, 11-XI-67; 1 female, same host, 19 km NW Urama, Km 40, Urama, 25 m, 20-X-65.

SUCRE: 1 female ex 1 *Vampyrops brachycephalus*, 1 male ex 1 *Phyllostomus hastatus*, 26 km ESE Carúpano, Manacal, 175-300 m, 20-31-VII-67.

T. F. AMAZONAS: 2 males ex *Vampyrops helleri*, 1 male and 1 female ex *Chiroderma villosum*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 6-27-VII-67; 1 male ex 1 *Vampyrodes caraccioli*, 56 km NNW Esmeralda, Caño Essa, Belén, 150 m, 14-II-67; 1 male ex *Vampyressa bidens*, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 24-IX-67; 2 males and 2 females, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-8-X-67; 1 male ex *Chiroderma villosum*, 14 km SSE Pto. Ayacucho, Chaparito, Pto. Ayacucho, 119 m, 2-X-67.

YARACUY: 16 males and 3 females ex *Vampyrops helleri*, 7 males and 3 females ex *Chiroderma villosum*, 20 km NW San Felipe, Minas de Aroa, 395-400 m, 6-22-XII-67; 1 female, same host, 11 km NW Urama, El Central, Urama, 25 m, 22-III-66.

ZULIA: 1 female ex *Vampyrops helleri*, 4 males and 1 female ex *Chiroderma villosum*, 42 km WNW Encontrados, El Rosario, 24 m, 4-5-III-68; 1 male ex *Vampyrops helleri*, 2 males and 1 female ex *Chiroderma villosum*, 48 km WNW Encontrados, El Rosario, 54 m, 25-26-II-68; 1 male ex *Vampyrops helleri*, 63 km WNW Encontrados, La Rinconada, El Rosario, 125 m, 28-II-68; 1 male and 1 female, same host, 65 WNW Encontrados, Caño Azul, El Rosario, 95 m, 1-I-68.

Paratrichobius longicrus (Ribeiro)
(Fig. 33, 37B)

Trichobius longicrus Ribeiro, 1907:236, Pl. 25
Paratrichobius longicrus Wenzel, Tipton, and Kiewlicz, 1966:521, Fig. 89

Wenzel et al.(loc. cit.) provisionally accepted *Artibeus jamaicensis* as the type host of *Paratrichobius longicrus*, as given by Ribeiro (loc. cit.). However, they pointed out that this host is seldom parasitized by species of *Paratrichobius* but, rather, by *Megistopoda aranea*. The data from the Venezuelan Survey collections clearly bear this out. Of 231 specimens of the *longicrus* complex that were taken from fruit bats, only 1 was from *A. jamaicensis*, while 190 were from 136 *Artibeus lituratus*. On the other hand, 529 *M. aranea* were taken from 326 *A. jamaicensis*, but only 2 from *A. lituratus*. According to Dr. Lindolpho Guimarães (pers. comm.), the type of *longicrus* was taken from a bat collected from a palm tree outside the National Museum at Rio

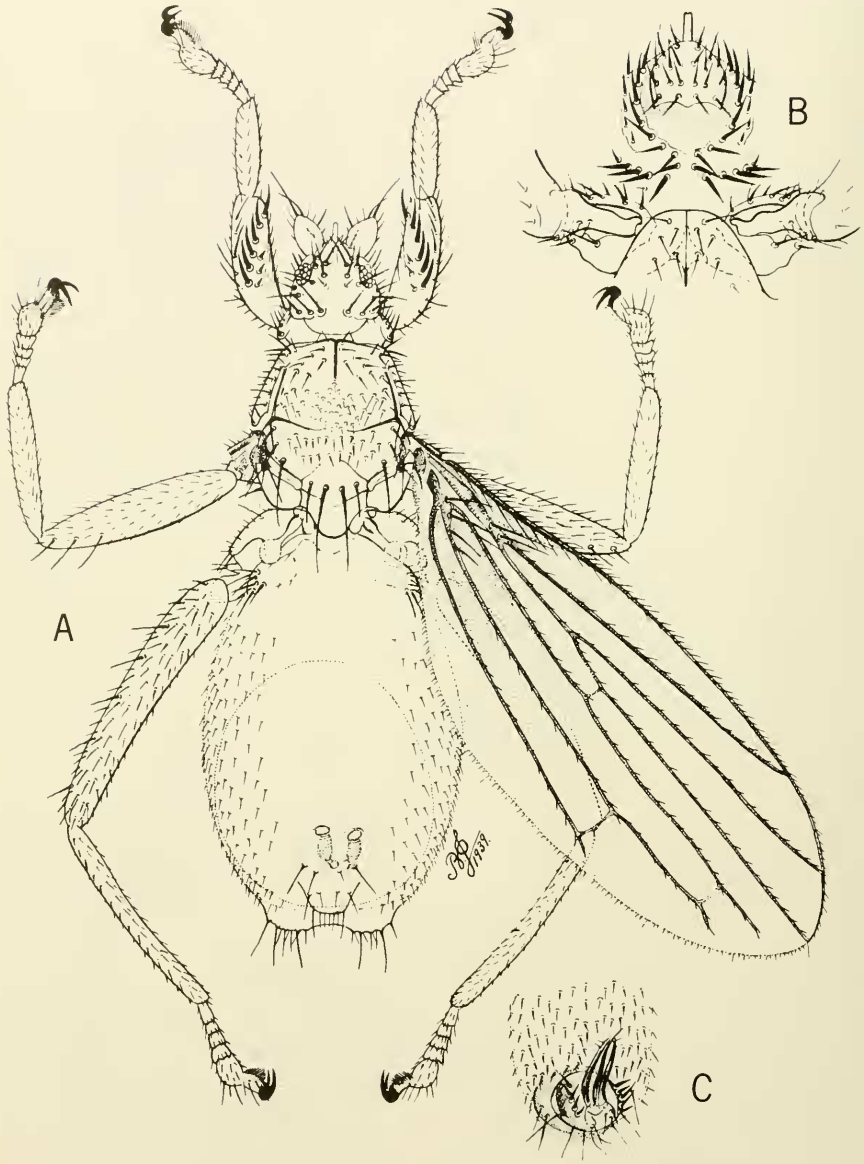

Fig. 34. *Paratrichobius dunni* (Curran), dorsal view. From Jobling (1939).

de Janeiro. In that locality and roosting site, the host was more apt to be *A. lituratus* than *jamaicensis*, although this species, too, may roost in palms. However, if the host was correctly identified, then in all likelihood the type of *longicrus* was a transfer or contaminant from *A. lituratus*.

I was not able to locate the type of *longicrus* in the collection at the National Museum in Rio de Janeiro, but I am unwilling to designate a neotype until further research shows that the type no longer exists. Since the evidence indicates that *A. lituratus* is the characteristic host, I regard specimens from that host as being *P. longicrus* Ribeiro. Jobling's excellent illustration (Fig. 33) of *longicrus* is of a specimen from *Artibeus lituratus*. Specimens from other hosts are recorded under "*Paratrichobius* species (*longicrus complex*)." See also Wenzel et al. (op. cit.).

Venezuelan Survey Records (103 males, 85 females, 4 sex undet.)

APURE: 23 males, 22 females, and 1 sex undet. ex *Artibeus lituratus*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 17-I—5-II-68.

BARINAS: 1 male and 3 females ex *Artibeus lituratus*, Altamira, 794 m, 9-11-I-68.

BOLÍVAR: 3 males and 1 female ex *Artibeus literatus*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 9-23-VI-66; 2 males, same host, 20 km W La Paragua, Hato San José, 300-306 m, 6-III—6-IV-67; 2 males and 2 females, same host, 85 km SSE El Dorado, Km 125, 602-1,032 m, 16-17-V-66.

CARABOBO: 1 male and 1 female ex *Artibeus lituratus*, 2 km SE Montalbán, Potrerito, Montalbán, 598 m, 1-XI-67; 2 males and 1 female, same host, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 28-30-XI-67.

DTO. FEDERAL: 8 males and 5 females ex *Artibeus lituratus*, 4 km NNW Caracas, Los Venados, 1,487-1,524 m, 21-VII—15-VIII-65.

FALCÓN: 1 male ex *Artibeus lituratus*, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 4-X-65; 1 female, same host, 14 km ENE Mirimire, nr. La Pastora, 122 m, 11-XI-67; 2 females, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-XI—1-XII-67; 10 males and 9 females, same host, 80 km NW Carora, Río Socopito, 470-480 m, 21-29-V-68; 3 males and 1 female, same host, 19 km NW Urama, Km 40, Urama, 25 m, 22-25-X-65.

MIRANDA: 3 males and 1 female ex *Artibeus lituratus*, 1 km E Río Chico, 1 m, 21-XI-66; 2 males and 2 females, same host, Birongo, 60 m, 22-23-I-68; 2 males, same host, 5 km NNW Guarenas, Curupao, 1,130-1,160 m, 13-14-X-66; 1 female, same host, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 28-IX-66.

NUEVA ESPARTA: 1 male ex *Artibeus lituratus*, 3 km NNE La Asunción, Isla Margarita, 38 m, 9-I-67.

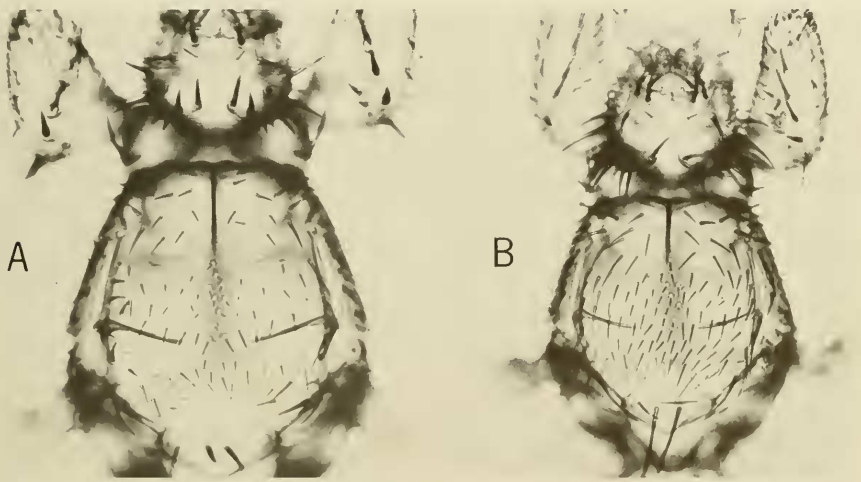

Fig. 35. Thorax, dorsal view: A, *Paratrichobius salvini* Wenzel; B, *Paratrichobius lowei* Wenzel. From Wenzel et al. (1966).

SUCRE: 3 females ex *Artibeus lituratus*, 21 km E Cumaná, 1 m, 14-XII-66; 2 males and 1 sex undet., same host, 12 km NE Güiria, Ensenada Cauranta 90 m, 17-19-VI-67; 2 males and 1 female, same host, 9 km NE Güiria, Ensenada Cauranta, 2-4 m, 3-6-VI-67; 1 male, same host, 26 km ESE Carúpano, Manacal, 366 m, 19-VII-67.

T. F. AMAZONAS: 1 male ex *Artibeus lituratus*, 32 km S Pto. Ayacucho, Pto. Ayacucho, 135 m, 13-X-67; 1 male, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 9-X-67; 1 male, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 12-VII-67; 2 males and 2 females, Río Orinoco, Tamatama, 135 m, 8-9-V-67.

TRUJILLO: 2 females ex *Artibeus lituratus*, 48 km WNW Valera, La Ceiba, 28 m, 5-XI-65; 1 female, same host, 20 km WNW Valera, nr. Sabana de Mendoza, Valera, 134 m, 27-VIII-65; 1 male, same host, 23 km N Valera, nr. Agua Viva, Valera, 164 m, 23-X-65; 1 female, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 15-VIII-65.

YARACUY: 1 male ex *Artibeus lituratus*, 20 km NW San Felipe, Minas de Aroa, 395 m, 14-XII-67.

ZULIA: 1 male and 1 female ex *Artibeus lituratus*, 42 km WNW Encontrados, El Rosario, 24 m, 5-III-68; 7 males and 6 females, same host, 48 km WNW Encontrados, El Rosario, 54 m, 25-27-II-68; 2 females, same host, 57 km WNW Encontrados, Espana, El Rosario, 61 m, 27-III-68; 1 female and 1 sex undet., same host, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 19-III-68; 9 males, 8 females, and 1 sex undet., same host, 63 km WNW Encontrados, La Rinconada, El Rosario, 125 m, 27-29-II-68; 7 males and 4 females, same host, 21 km SW Machiques, Kasmera, 270 m, 17-24-IV-68; 3 males and 1 female, same host, 19 km WSW Machiques, Novito.

OTHER VENEZUELAN MATERIAL EXAMINED

ARAGUA: 1 sex undet. ex *Artibeus lituratus*, Rancho Grande (El Limón), 30-III-60, C. O. Handley, Jr.

Paratrichobius species (*longicrus* complex)

VENEZUELAN SURVEY RECORDS (79 males, 56 females, 1 sex undet.)

APURE: 1 female ex 1 *Desmodus rotundus*, 1 male ex 1 *Carollia perspicillata*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 24-31-I-68.

BARINAS: 1 male ex *Vampyrops vittatus*, 2 km SW Altamira, Altamira, 619 m, 5-I-68.

BOLÍVAR: 18 males, 9 females, and 1 sex undet. ex *Vampyrops aurarius*, 85 km SSE El Dorado, Km 125, 589-1,165 m, 23-III—26-V-66.

CARABOBO: 3 males and 1 female ex *Vampyrops umbratus*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 29-XI—1-XII-67.

DTO. FEDERAL: 3 males and 2 females ex *Vampyrops vittatus*, 20 males and 13 females ex *Vampyrops umbratus*, 4 km NNW Caracas, Los Venados, 1,400-1,559 m, 22-VII—15-VIII-65; 1 male and 4 females, same host, 1 female ex *Vampyrops vittatus*, 6 km NNW Caracas, nr. Boca Tigre, Pico Ávila, 2,025-2,119 m, 30-VIII-65, 8 males and 3 females ex *Vampyrops umbratus*, 33 km WSW Caracas, Alto Ño León, 1,665 m, 25-26-V-67; 1 male and 2 females, same host, 1 male ex *Artibeus jamaicensis*, 5 km NW Caracas, nr. Clavelitos, Boca Tigre Valley, 1,394 m, 27-VIII-65; 10 males and 9 females, same host, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,092-2,240 m, 18-VIII—27-IX-65.

MIRANDA: 8 males and 9 females ex *Vampyrops umbratus*, 5 km NNW Guarenas, Curupao, 1,160-1,180 m, 6-14-X-66; 1 female, same host, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,124 m, 13-IX-65.

MONAGAS: 1 male ex *Vampyrops umbratus*, 3 km NW Caripe, nr. San Agustín, 1,165 m, 1-VII-67; 1 male, same host, 5 km NW Caripe, San Agustín, 1,180 m, 14-VII-67.

T. F. AMAZONAS: 1 female ex *Vampyrops aurarius*, Caño Culebra, 50 km NNW Esmeralda, Cerro Duida, 800 m, 17-I-67.

ZULIA: 1 male ex *Glossophaga soricina*, 48 km WNW Encontrados, El Rosario, 54 m, 27-II-68.

OTHER VENEZUELAN MATERIAL EXAMINED

ARAGUA: 1 male and 1 female ex *Vampyrops dorsalis* (= *V. umbratus*), Rancho Grande, Biol. Station, 1,090 m, 10-VIII-62, C. and A. J. Machado.

CARABOBO: 2 males and 1 female ex *Myotis* sp. (!), Yuma, 2-VII-55, F. Fernandez Y.

DTO. FEDERAL: 1 male and 1 female ex *Vampyrops* sp., Silla de Caracas, 2,200 m, 21-X-62, J. Ojasti.

Genus *Neotrichobius* Wenzel and Aitken

Neotrichobius Wenzel and Aitken, 1966:536

TYPE SPECIES: *Neotrichobius stenopterus* Wenzel and Aitken, 1966:539

Wenzel and Aitken (loc. cit.) erected this genus for a new species, *Neotrichobius stenopterus*, from Panama, Surinam, and Trinidad. Earlier that year, Machado-Allison (1966:76)

described a species of this genus under the name *Pterellipsis delicatus*. In 1970 (p. 100.9), Wenzel placed *stenopterus* as a synonym of *delicatus*. Study of the extensive Venezuelan series of *Neotrichobius* from a number of hosts shows that *stenopterus* and *delicatus* are distinct and that "*delicatus*" may in fact be a species complex. Restudy of the type series of *stenopterus* shows that it included two Panamanian specimens of *delicatus*, one Trinidadian specimen of the "*delicatus* complex," and one specimen (Surinam) of *bisetosus* n. sp.

The known species of *Neotrichobius* parasites of bats of the Subfamily Stenodermatinae and of *Rhinophylla pumilio* (Subfamily Carolliinae).

Key to the Species of *Neotrichobius*

1. Second (most posterior) longitudinal wing vein continuing beyond *r-m* to apex of wing where it unites with costa 3
   Second vein not reaching apex, extending only a little beyond *r-m* as a spur (Fig. 36B) 2
2. Scutellum with 2 macrosetae only ..... *bisetosus* n. sp.
   Scutellum with a pair of median macrosetae and, on each side of these, a seta that is half as long ..... *stenopterus* Wenzel and Aitken
3. Row of setae along dorsoposterior margin of tergum 1+2 interrupted at middle. Wing vein *r-m* situated at or beyond midlength of wing ..... *ectophyllae* n. sp.
   Row of setae along dorsoposterior margin of tergum 1+2 not interrupted but doubled at middle. Vein *r-m* situated before midlength of wing ..... *delicatus* Machado-Allison

Neotrichobius stenopterus Wenzel and Aitken
(Fig. 36, 37D)

Neotrichobius stenopterus Wenzel and Aitken, 1966:539, Fig. 97-99.—Wenzel, 1970:9 (as syn. of *delicatus* Machado-Allison, in error)

This species was not collected in Venezuela, but, based on distributions of other parasites, I would not be surprised if it were found on *Artibeus cinereus* in Trujillo and Zulia. Specimens of this host were collected in those states, but no flies were recovered from them. It should be noted that in Panama most specimens were taken from *A. cinereus* (possibly *A. watsoni* or *A. phaeotis*), but in Venezuela only specimens of the "*delicatus*" complex were taken from this host.

The character states which distinguish *stenopterus* from the other species are given in the key and in the descriptions of the new species. As noted above, the paratype series of *stenopterus* was a mixture of three species.

Neotrichobius bisetosus, new species
(Fig. 37E)

Neotrichobius stenopterus Wenzel and Aitken, 1966:539 (part, Surinam record ex *Phyllostomus hastatus*)

Closest to *Neotrichobius stenopterus* in head structure, wing venation, and chaetotaxy, but conspicuously different from it and other species in having only 2 scutellar setae instead of 4, and in having femora nearly thrice (rather than twice) as long as the thorax. The outer pair of scutellar setae are frequently absent in *delicatus*, but such specimens can be readily separated from *bisetosus* by the wing venation and length of the hindfemora, which are only as long as the thorax in *delicatus*.

Description

The description of *Neotrichobius stenopterus* applies equally well to *bisetosus* except as follows: *Head*. Eyes with 14 facets (15-16 in *stenopterus*). Each laterovertex usually with 6, rarely 5 setae (5 in *stenopterus*), 2 of them long, strong macrosetae, the others of varying lengths, but at least 1 very short. Posterior margin of occipital lobes usually with 4, sometimes 5 (rather than 5-6) strong, short setae, and below these a row of 4-5 very short inconspicuous spinelets (these conspicuous, stout, and longer in *stenopterus*). Outer pair of basal row of thecal setae distinctly longer and stronger than the median pair (all short, subequal in *stenopterus*).

Thorax. Prescutum with the usual short setae on each side of median suture near anterior margin; with 1-2 very stout setae near inner margin of spiracle (3-4, rarely 2 *stenopterus*); 2 short setae on each side, medial to these spiraculars (1, rarely 2 in *stenopterus*); at center on each side is 1 longer seta that is much weaker than the spiraculars, and about twice as long as the short setae anterior to it; posterolateral angles with 1-3 (usually 2) setae, 1 longer than the others, along margin (as opposed to usually 1, sometimes 2, rarely 3 in *stenopterus*); with 2-3 (rarely 1) minute setae, at least on

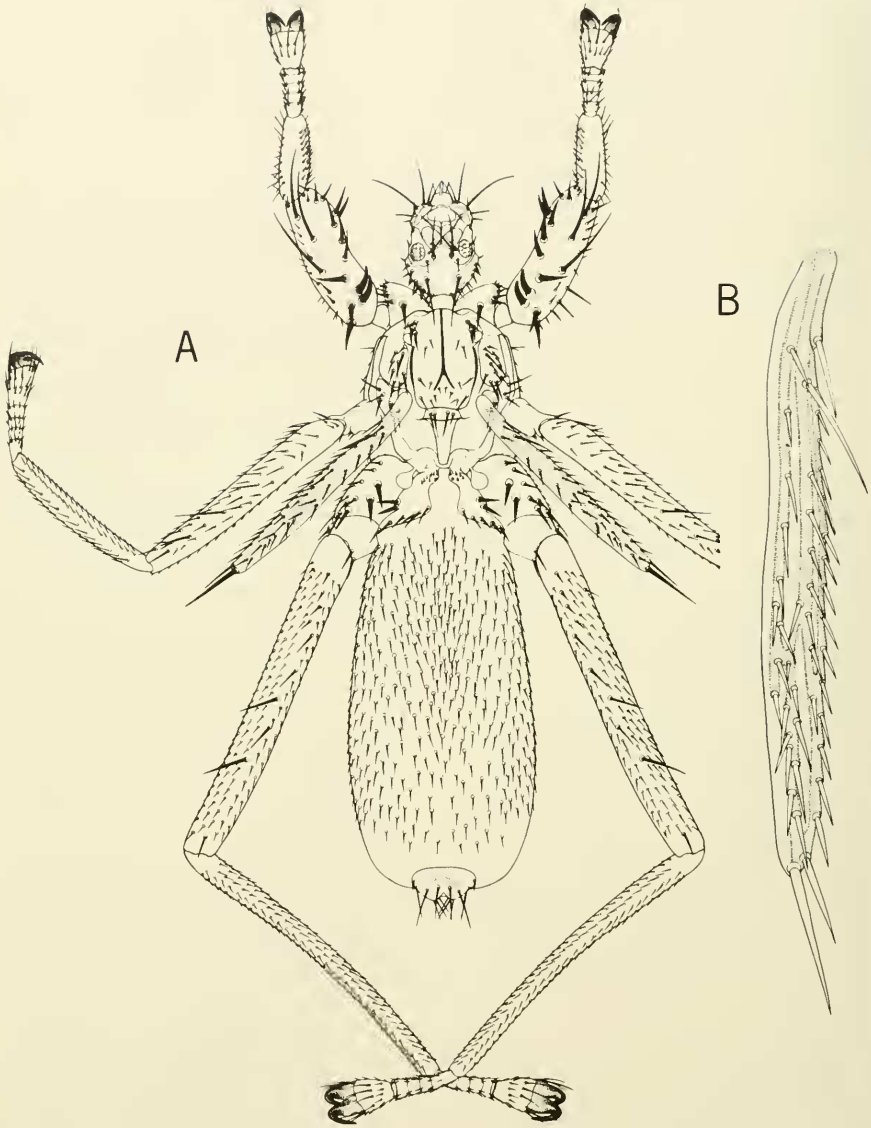

Fig. 36. *Neotrichobius stenopterus* Wenzel and Aitken, female: A, dorsal view and B, wing. From Wenzel et al. (1966).

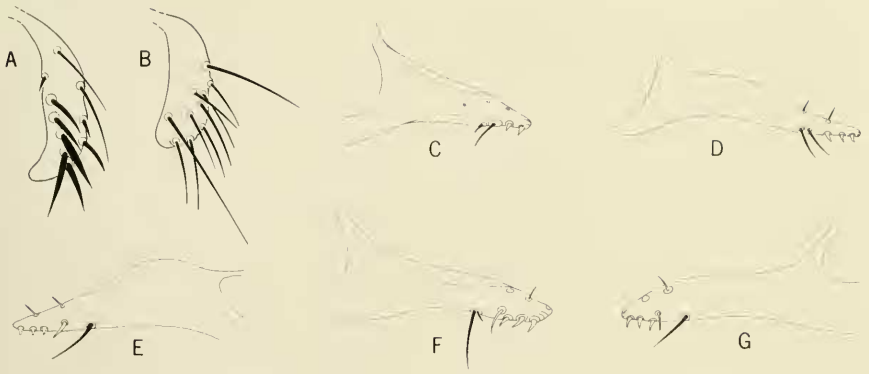

Fig. 37. A-B. left ventroapical margin of tergus 9: A, *Paratrichobius dunni* (Curran); B, *Paratrichobius longicrus* Ribeiro. C-G, male postgonites of species of *Neotrichobius*: C, *Neotrichobius ectophyllae*, new species (SVP 19282); D, *Neotrichobius stenopterus* Wenzel and Aitken (Panama, ex *Artibeus cinereus*, Tipton-Handley 11239); E, *Neotrichobius bisetosus*, new species (Surinam, ex *Phyllostomus hastatus*, FMNH 93180); F-G, *Neotrichobius delicatus* Machado-Allison (SVP 31945). A-B from Wenzel et al. (1966).

one side, between these and the median suture (1 in *stenopterus*). Scutum behind fork of median suture, with 4-6 (mean, 4.5) minute discal setae (6-9, mean 6.9 in *stenopterus*); a long macroseta on each side. Scutellum with 1 pair of macrosetae.

Wings. Vein 1 branched at about apical third (rather than beyond middle), its anterior branch joining the costa at about apical fourth (rather than apical third); spur of vein 2 beyond *r-m* usually distinctly longer than in *stenopterus*.

Legs. Hindfemora greatly elongated, nearly three times as long as thorax, measured from dorsal anterior margin to apex of postonotum.

Abdomen. Posterior margin of tergum 1+2 with a group of 8-10 long macrosetae on each side (7-9 in *stenopterus*), the two groups distinctly separated at middle. Male postgonites very similar to those of *stenopterus*, but not as slender and with only 2 rather than 3 denticles on ventral margin behind apex; ventral macroseta and accessory setae equal in length, indistinguishable from each other.

Type Data: Holotype male and allotype female ex *Artibeus fuliginosus* (SVP 19087), Venezuela, T. F. Amazonas, Río Orinoco, Tamatama, 135 m, 15-V-67. Paratypes—VENEZUELA. Bolívar: 1 male and 1 female ex *Artibeus fuliginosus*, 50 km SE El Manteco, Río Supamo, 150 m, 7-11-IV-66. T. F. Amazonas: 1 female ex 1 *Artibeus jamaicensis*, 6 males and 3 females ex *Artibeus fuliginosus*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-12-IV-67; 4 males and 6 females, same host, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 2-I—6-II-67; 2 males and 4 females, same host, 56 km NNW Esmeralda, Caño Essa, Belén, 150 m, 7-II-67; 8 males and 8 females, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 2-I—12-II-67; 1 male, same host, 84 km SSE Esmeralda, 7 km up Río Mavaca, Boca Mavaca, 138 m, 3-III-67; 4 males, 6 females, and 1 sex undet., same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V—1-VI-67; 2 males and 1 female, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 14-VII-67; 2 males and 1 female, same host and locality data as the holotype but 25-IV—15-V-67.

Other Material Examined

A paratype of *Neotrichobius stenopterus* Wenzel and Aitken (loc. cit.) ex *Phyllostomus hastatus* (Surinam) which proved to be *N. bisetosus* n. sp.

Measurements

	Males	Females (Allotype)
BL	1.52-1.88	1.95
TL	0.46-0.52	0.52
FL	0.94-1.00	1.03

Neotrichobius delicatus (Machado-Allison)
(Fig. 37F, G)

Megistopoda delicatus Machado-Allison, 1966: 76, Fig. 8-11

Neotrichobius stenopterus Wenzel and Aitken, 1966:539, Fig. 97-99 (part, Panamanian records ex *Vampyressa pusilla*)

Neotrichobius delicatus Machado-Allison, Wenzel, 1970:100.9 (new comb.)

This species was taken from a number of hosts, and from the data one suspects that the series recorded here represents several entities. Measurements of thorax and hindfemora of specimens from the various hosts show that those from *Vampyressa pusilla*, the type host of *delicatus*, have shorter legs and thorax, on the average, than do those from *Artibeus cinereus*, *Rhinophylla pumilio*, and *Artibeus* sp. A. This is evident even considering the small samples measured (8-10 specimens each). The mean length of the thorax of specimens from the last three hosts ranges from 0.48-0.50 mm., but in those from *V. pusilla* it is only 0.43 mm. On the other hand, the mean length of the hindfemora is 0.88 mm. for specimens from *pusilla*, 0.96 mm. for those from *Artibeus* sp. A, 0.98 mm. for those from *R. pumilio*, and 1.05 mm. for those from *A. cinereus*.

While these samples are very small, it is clear that populations from the various hosts do differ. Measurements of the two specimens from *Uroderma bilobatum* and *Vampyrops helleri* fall within the size classes of specimens from *V. pusilla*. I have been unable to detect any differences in chaetotaxy, wing venation, or structure of the male postgonites between specimens from the various hosts.

I have listed as *N. delicatus* only those specimens that were collected from the type host, *Vampyressa pusilla*. Other specimens are listed under *Neotrichobius* species (*delicatus* complex).

Venezuelan Survey Records (22 males, 13 females, 1 sex undet. ex 25 *Vampyressa pusilla*)

BARINAS: 4 males and 2 females, 2 km SW Altamira, Altamira, 609-619 m, 1-5-I-68; 2 males and 1 sex undet., Altamira, 794 m, 21-XII-67—11-I-68.

CARABOBO: 9 males and 6 females, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 27-XI—1-XII-67; 4 males and 5 females, 9 km NE Montalbán, Cumbre Canoabo, Montalbán, 727-773 m, 1-XI-67.

YARACUY: 3 males, 20 km NW San Felipe, Minas de Aroa, 395-400 m, 9-22-XII-67.

Other Material Examined

Two Panamanian paratypes (Wenzel and Aitken, loc. cit., p. 540) of *Neotrichobius stenopterus* from *Vampyressa pusilla* that were proved to be *N. "delicatus."*

Neotrichobius species (*delicatus* complex)

Neotrichobius stenopterus Wenzel and Aitken, 1966:539 (part, Trinidad record ex *Artibeus cinereus*)

Venezuelan Survey Records (85 males, 43 females, 4 sex undet.)

APURE: 9 males and 2 females ex *Artibeus cinereus*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 17-I—5-II-68.

BARINAS: 2 males ex *Artibeus cinereus*, 1 female ex 1 *Vampyrops helleri*, 2 km SW Altamira, Altamira, 609-619 m, 1-5-I-68.

BOLÍVAR: 1 male, 1 female, and 1 sex undet. ex *Rhinophylla pumilio*, 1 male and 2 females ex *Artibeus cinereus*, 150 m, 8-25-VI-66; 14 males and 6 females, same host, 4 males and 5 females ex *Rhinophylla pumilio*, 85 km SSE El Dorado, Km 125, 889-1,032 m, 9-19-V-66; 1 male, same host, 50 km SE El Manteco, Río Supamo, 150 m, 10-IV-66; 1 female ex *Artibeus cinereus*, 20 km W La Paragua, Hato San José, 324 m, 20-III-67; 1 male and 1 female, same host, 23 km NE Icabarú, El Pauji, Icabarú, 824 m, 27-IV-68; 1 male, same host, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 2-V-68.

CARABOBO: 20 males and 6 females ex *Artibeus cinereus*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 27-XI—1-XII-67; 1 male and 1 female, same host, 9 km NE Montalbán, Cumbre Canoabo, Montalbán, 727-773 m, 1-XI-67.

DTO. FEDERAL: 1 male ex *Artibeus cinereus*, 4 km NNW Caracas, Los Venados, 1,524 m, 25-VII-65; 1 male and 2 females, same host, 6 km NNW Caracas, nr. Boca Tigre, Pico Ávila, 1,982-2,119 m, 24-30-VIII-65.

FALCÓN: 1 female ex *Artibeus cinereus*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 30-XI-67; 1 male, same host, 80 km NW Carora, Río Socopito, 480 m, 21-V-68; 1 male and 1 female, same host, 19 km NW Urama, Km 40, Urama, 25 m, 13-X-65.

GUÁRICO: 2 males ex *Artibeus cinereus*, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66.

MIRANDA: 1 male ex *Artibeus cinereus*, 7 km N Río Chico, nr. Paparo, 1 m, 15-XI-66; 3 males and 4 females, same host, 5 km NNW Guarenas Curupao, 1,160-1,180 m, 7-13-X-66.

SUCRE: 1 male ex *Artibeus cinereus*, 9 km NE Güiria, Ensenada Cauranta, 1 m, 5-VI-67; 2 males, 2 females, and 1 sex undet., same host,

26 km ESE Carúpano, Manacal, 175-315 m, 18-31-VII-67.

T. F. AMAZONAS: 1 female ex *Artibeus cinereus*, 3 males and 1 female ex *Rhinophylla pumilio*, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 29-V–2-VI-67; 3 males and 1 female, same host, 1 male ex *Artibeus* sp. A, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-9-X-67; 1 female ex 1 *Uroderma magnirostrum*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 12-VII-67; 2 males ex *Artibeus cinereus*, Caño Culebra, 50 km NNW Esmeralda, Cerro Duida, 800 m, 19-I-67; 1 female ex 1 *Artibeus jamaicensis*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 4-IV-67; 1 male ex *Artibeus* sp. A, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I-67; 5 males and 1 female, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 13-IV-67.

ZULIA: 1 male ex 1 *Uroderma bilobatum*, 1 male and 1 sex undet. ex *Artibeus cinereus*, 63 km WNW Encontrados La Rinconada, El Rosario, 125 m, 28-29-II-68; 1 female, same host, 48 km WNW Encontrados, El Rosario, 54 m, 25-II-68.

Other Material Examined

The female paratype of *Neotrichobius stenopterus* Wenzel and Aitken (loc. cit.) ex *Artibeus cinereus*, Trinidad, which proved to be "*delicatus*."

Neotrichobius ectophyllae, new species

(Fig. 37C)

Similar to *Neotrichobius delicatus* in wing venation, in possessing relatively short hindlegs, and in that the two posterior spinelike setae on the inner dorsal edge of the profemur, opposite the two curved, very strong submarginal spines on inner face, are very unlike the more distal spinelike setae of the diagonal row; both of these basal setae are conspicuously weaker in *ectophyllae*, while in *delicatus* the basal one is stronger and longer than the distal spines, the next one shorter and weak. In *N. bisetosus* n. sp. and *N. stenopterus*, the two basal setae of the dorsal diagonal row are heavy spines like the distal ones. *Neotrichobius ectophyllae* differs conspicuously from *delicatus*, in that the row of setae along the posterior margin of tergum 1+2 is single and clearly interrupted at middle; this row is complete and double at middle in *delicatus*. The supra-anal plate of the female has two discal microsetae, one on each side near margin. These are absent in all other species, though it was mistakenly figured as present in *stenopterus* (Wenzel and Aitken, 1966:539).

Description

The description of *Neotrichobius sctenopterus* Wenzel and Aitwen (loc. cit.) applies equally well to *ectophyllae* n. sp. except for the following distinctive characters.

Head. Theca with arcuate but subparallel sides, longer than broad; distal margin with four subequal, strong, but not spinelike setae on distal margin, the outer two sometimes slightly shorter; ventral surface with a transverse row of four shorter, finer, subequal setae at apical third and another row of four at about basal third (in *stenopterus* the outer distal setae are spinelike, heavier than inner pair, and there is a pair of similar spinelike setae one on each side posterior to these, with a pair of fine setae between and slightly posterior to them, and a transverse row of four near base).

Thorax. Prescutum near anterior margin with the usual short seta on each side of median suture, and three strong, fairly long "spiracular" setae on each side medial to the spiracle; medial to these a shorter, finer seta, and posterior to this a strong, long seta similar to those of the spiracular group (in *stenopterus* there are three or four strong spiraculars, often much longer and spinelike, and the median setae are conspicuously weaker and usually much shorter than the spiraculars); posteriorly, on each side of fork of median suture are from two to three (rarely one) short, finer setae, and along lateral margin, in tandem, a pair of strong, fairly long setae similar to the spiraculars. Scutum with seven to nine short, fine, discal setae and on each side in posterolateral angles are one strong macroseta and sometimes one short fine seta (in *stenopterus*, there is only one minute seta lateral to fork of median suture, and or two setae along each lateral margin, one of these stronger than the other, but conspicuously shorter and weaker than the spiraculars). Scutum with six to nine fine, short setae and the usual strong marginal macroseta. Scutellum with four setae, the median pair being macrosetae about twice as long as the outer pair.

Wings. Of about the same relative size as in *stenopterus* but first longitudinal vein branched slightly before midlength, the anterior branch joining the costa a little beyond midlength, the posterior branch joining costa before apex; *r-m* a little beyond midlength of wing, the second vein joining costa at apex.

Legs. Profemora with chaetotaxy as in *stenopterus* but inner dorsal margin (dorsal to the two curved submarginal spines on inner face) with a strong basal macroseta, followed by two shorter, much weaker setae, and distal to these

a row of five stout spines, as in *delicatus*. Mid- and hindlegs shorter, as in *stenopterus*, hindfemora almost exactly twice as long as thorax (measured from anterior margin to tip of postnotum).

Abdomen. Sternum 2, distal to the basal group of spinelike setae, with a triangular area of 13-15 much finer setae similar to those of the ventral connexivum; posterior margin with 12-14 setae, these usually consisting of a median pair similar to the connexival setae, a slender macroseta on each side, and lateral to these about 4-5 shorter setae, these sometimes spinelike. FEMALE. Tergum 7 absent as usual. Supraanal plate with a minute seta at about midlength on each side near margin. Seventh sternites each with about 5 very short setae and 2 macrosetae. MALE. Sternum 5 with discal setae like those of adjacent connexivum but generally slightly shorter; setae of apical margin abraded in the type, except on far right side where there is 1 macroseta (longer than sternum) and lateral to this 2 shorter setae. Sternum 7+8 with a pair of dorsal macrosetae and on each lateral margin 1 short, stout seta. Each side of tergum 9 with a strong dorsolateral macroseta, 1 distal macroseta, 1 shorter but strong basal seta along each inner margin, and 2 shorter setae near ventrolateral margin.

Postgonites rather short and strongly tapered, the right one a little heavier; ventral margin of each with 2 denticles between apex and ventral macroseta, this inserted far distad, the one on left postgonite somewhat more so than that on the right; accessory seta about half as long as, and inserted somewhat below and anterior to, the macroseta; other setae apparently broken off in the unique male.

MEASUREMENTS

	Males	Females
BL	1.52	1.58-1.86
TL	0.44	0.43-0.47
FL	0.86	0.86-0.91

TYPE DATA: Holotype male ex *Ectophylla macconelli* (SVP 19282) and allotype female, same host (SVP 19436), and 4 female paratypes, same host, Venezuela, T. F. Amazonas, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 29-V—1-VI-67.

Genus *Megistopoda* Macquart

Megistopoda Macquart, 1852:332.—Maa, 1965: 385.—Wenzel, Tipton, and Kiewlicz, 1966: 541.—Machado-Allison, 1966:69

TYPE SPECIES: *Megistopoda pilatei* Macquart, 1852:332.

Pterellipsis Coquillet, 1899-333.—Jobling, 1936: 357.

TYPE SPECIES: *Pterellipsis aranea* Coquillett, 1899:333.

In addition to the large series (529 specimens) of *Megistopoda aranea* that are treated below, the collections made by the survey teams included 1,358 specimens of the *Megistopoda proxima* complex. These included 971 ex 509 *Sturnira lilium* from 65 localities in 15 states; 215 ex 123 *S. ludovici* from 17 localities in 8 states; 135 ex 77 *S. tildae*, from 8 localities in Bolívar and T. F. Amazonas; and 19 ex 15 *S. erythromos*, from 2 localities in Monagas and Dto. Federal. The remaining 18 specimens are from 11 different host species, mostly fruit-eating bats, from various localities.

The specimens from *S. tildae* appear to represent a new species of the *proxima* complex. In reviewing the material from Venezuela, it became evident that the taxonomy of this complex cannot be resolved without undertaking a revision of all available material. Since this is beyond the scope of the present paper, I have deferred it for a later report.

Megistopoda aranea (Coquillett)

Pterellipsis aranea Coquillett, 1899:344.—Wenzel, Tipton, and Kiewlicz, 1966:542, Fig. 100A, D.—Machado-Allison, 1966:70.

Megistopoda desiderata Speiser, 1900:57, Pl. 3, Fig. 6-8.

Megistopoda pilatei Macquart, 1852:332.—Wenzel, Tipton, and Kiewlicz, 1966:541-542.

Megistopoda aranea is easily separated from members of the *M. proxima* complex as follows:

Wings narrow, with only 4 longitudinal veins. Legs very long: hindfemora as long as or nearly as long as the entire body. Prescutum with very weak setae along median suture; each lateral margin, along notopleural suture, with one or two longer setae ..... *Megistopoda aranea* Coquillett

Wings broader, venation as in Fig. 38E. Legs shorter, hindfemora only a little longer than abdomen. Prescutum with short but strong setae along median suture; four strong setae usually present along each margin ..... *Megistopoda proxima* complex

Venezuelan Survey Records (337 males, 206 females, and 3 sex undet.)

To briefly summarize, the survey teams collected this fly at 62 localities in 16 states as follows: Apure (2 localities, 24-76 m); Barinas (1 locality, 609-611 m); Bolívar (3 localities, 150-324 m); Carabobo (4 localities, 598-1,007 m); Dto. Federal (4 localities, 398-2,050 m); Falcón (7 localities, 2-480 m); Guárico (5 localities, 100-630 m); Lara (1 locality, 528 m); Miranda (5 localities, 1-1,180 m); Monagas (1 locality, 1,170 m); Nueva Esparta (2 localities, 38-53 m); Sucre (6 localities, 1,300 m); T. F. Amazonas (9 localities, 119-1,524 m); Trujillo (4 localities, 28-900 m); Yaracuy (1 locality, 395 m); Zulia (8 localities, 24-1,135 m).

Other Venezuelan Material Examined

ARAGUA: 3 sex undet. ex 1 *Artibeus jamaicensis*, Rancho Grande Biol. Sta., 30-III-60, C. O. Handley, Jr.

BOLÍVAR: 1 female ex *Artibeus lituratus*, 38 km S El Dorado, 2-VIII-62, J. Ojasti.

MIRANDA: 5 males and 1 sex undet. ex *Artibeus jamaicensis*, El Cafetal, 8-IV-62, J. Ojasti.

Host Associations

Of 545 specimens of *Megistopoda aranea* collected by the survey teams, 530 (97 percent) were from 326 *Artibeus jamaicensis*. The remaining 16 (3 percent) were from 15 bats from 11 different species.

Megistopoda proxima (Séguy)
(Fig. 38)

Pterellipsis proxima Séguy, 1926:194, Fig. 2-6.

Our interpretation (Wenzel et al., 1966:543) of *Megistopoda proxima* (Séguy) was based on Séguy's (loc. cit.) illustrations which showed prominent denticles on the ventral margins of the male postgonites. Through the kindness of Dr. Loïc Matile of the Paris Museum, I have been able to reexamine the type of *proxima*. Unfortunately, the type slide was broken in half (in shipment), and the tips of the postgonites were broken off. Nevertheless, it is clear that their ventral margins are curved, as in *theodori*, not straight as in the species we recorded as *proxima*. Further, it is now evident that minute denticles are present in "*theodori*" though they are often lost when specimens are processed in caustic for mounting on slides. *Megistopoda theodori* Wenzel could be a synonym of *proxima*, but a decision is deferred pending further study. The species treated by us (op. cit., p. 543, Fig. 100C, 101) as *M. proxima* is new and will be described later.

Genus *Mastoptera* Wenzel

Mastoptera Wenzel, 1966:512

Type Species: *Aspidoptera minuta* Lima, 1921:21

In these tiny mitelike flies, unlike any other Streblidae, the dorsal abdominal connexivum is lightly sclerotized, especially between the lateral lobes of tergum 1+2. This is almost impossible to detect in cleared specimens. Occasionally, it is as strongly sclerotized and pigmented basally as the lateral lobes of tergum 1+2, and the sclerotized area is separated from the lateral lobes by a membranous "suture." The degree of sclerotization seems to vary according to species.

Key to Described Species of *Mastoptera*

1. Males 2
   Females 3

2. Dorsolateral connexivum usually with 1 or 2 setae behind lateral lobes of tergum 1+2, these longer and much heavier than the others. Setae along posterior margin of sternum 2 scarcely, if at all, longer than the ventral connexival setae posterior to them ..... *guimaraesi* Wenzel
   Dorsolateral connexivum never with 1 or 2 conspicuously stronger setae behind lateral lobes of tergum 1+2. Setae along posterior margin of sternum 2 distinctly longer than the ventral connexival setae posterior to them ..... *minuta* complex

3. Lateral lobes of tergum 1+2 unusually long and narrow, apical half with subparallel sides, about as wide as hind tibiae; connexivum behind, and usually slightly medial to apices of lateral lobes, with 1 or 2 setae which are longer and much stronger (sometimes macrosetae) than surrounding connexival setae. Sternum 2 nearly as long as venter of thorax, the median discal setose area narrowing from base to apical margin (where it occupies ca. midthird of width); lateral to this area there are only marginal setae, there being no submarginal discal setae anterior to them. Seventh

sternites largely bare except for macrosetae along base and short setae along inner margin to apex ..... *guimaraesi* Wenzel

Lateral lobes of tergum 1+2 much shorter and broader, sides rather evenly converging to apex. Sternum 2 only slightly longer than metasternum, the median setose area widening apically and extending laterally to the posterolateral angles as an irregular single to double row, anterior to the marginal setae. Seventh sternites setose throughout, without a conspicuous nude area ..... *minuta* complex

Mastoptera guimaraesi Wenzel
(Fig. 39, 40A)

Mastoptera guimaraesi Wenzel, 1966:514, Fig. 82C, 83, 84

VENEZUELAN SURVEY RECORDS (40 males, 47 females, 1 sex undet.)

APURE: 10 males and 4 females ex *Phyllostomus hastatus*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 17-31-I-68.

BARINAS: 1 female ex *Phyllostomus hastatus*, 2 km SW Altamira, Altamira, 620 m, 26-XII-67; 1 male, same host, Altamira, 794 m, 10-I-68.

CARABOBO: 1 male and 5 females ex *Phyllostomus hastatus*, 6 km N Urama, Urama, 60 m, 17-III-66.

FALCÓN: 1 female ex *Phyllostomus hastatus*, 80 km NW Carora, Río Socopito, 480 m, 20-V-68.

TRUJILLO: 2 females ex *Phyllostomus hastatus*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 5-IX–7-X-65; 1 male and 1 female, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 22-X-65.

YARACUY: 2 males and 2 females ex *Phyllostomus hastatus*, 11 km NW Urama, El Central, Urama, 25 m, 14-III-66; 2 males and 3 females, same host, 13 km NW Urama, El Central, Urama, 25 m, 20-III-66.

ZULIA: 2 males and 3 females ex *Phyllostomus hastatus*, 33 km NW La Paz, nr. Cerro Azul, 75 m, 13-VI-68; 17 males, 14 females, and 1 sex undet., same host, 1 female ex *Phyllostomus discolor*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III–1-IV-68; 1 female, same host, 45 km WNW Encontrados, El Rosario, 37 m, 31-III-68.

HOST ASSOCIATIONS

Of the 88 specimens of *Mastoptera guimaraesi* that were collected by the survey teams, 84 were from 23 *Phyllostomus hastatus*. Unfortunately, I do not have subspecies identifications of the survey specimen of the host bats. However, examination of the distribution of the subspecies of *Phyllostomus hastatus*, as given by Valdez (1970, unpubl. thesis) shows that most specimens of *M. guimaraesi* were collected in the area where the host subspecies *P. hastatus panamensis* occurs, in northwestern Venezuela. Specimens of *Mastoptera* from other areas of Venezuela, where *P. hastatus hastatus* occurs, are a different species belonging to the *minuta* complex, though both species of *Mastoptera* were collected in one area in Yaracuy (see below).

Mastoptera minuta (Lima)
(Fig. 40B)

Aspidoptera minuta Lima, 1921:21, Pl. 2, Fig. 2

Mastoptera minuta, Wenzel, Tipton, and Kiewlicz, 1966:515, Fig. 82B, 85 (part, records from *Tonatia silvicola*)

Through the kind help of Dr. Adriano L. Peracchi, of the Universidad Rurale, Campo Grande, G. G., Brazil, I was able to search for and examine Streblidae from the collection of da Costa Lima in the Universidad and the Instituto Oswaldo Cruz. No specimens of *minuta* were found. If still extant, the type is elsewhere. The host given for the type was *Tonatia silvicola*. While there is no assurance that this identification is correct, I regard specimens of *Mastoptera* taken from that host as being *Mastoptera minuta*. Specimens of "*minuta*" from other hosts are recorded under "*Mastoptera* species (*minuta* complex)" (q.v.).

VENEZUELAN SURVEY RECORDS (26 males, 32 females, 2 sex undet. ex 23 *Tonatia silvicola*)

FALCÓN: 4 males and 2 females, 19 km NW Urama, Km 40, Urama, 25 m, 25-X–12-XI-65.

T. F. AMAZONAS: 2 males and 1 female, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I-67; 14 males, 21 females, and 1 sex undet., 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V–12-VI-67; 1 sex undet., 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 9-X-67; 2 females, 108 km, SSE Esmeralda, Río Mavaca, 140 m, 5-12-IV-67; 1 male, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 24-VII-67.

TRUJILLO: 4 males and 6 females, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 20-VIII–18-X-65.

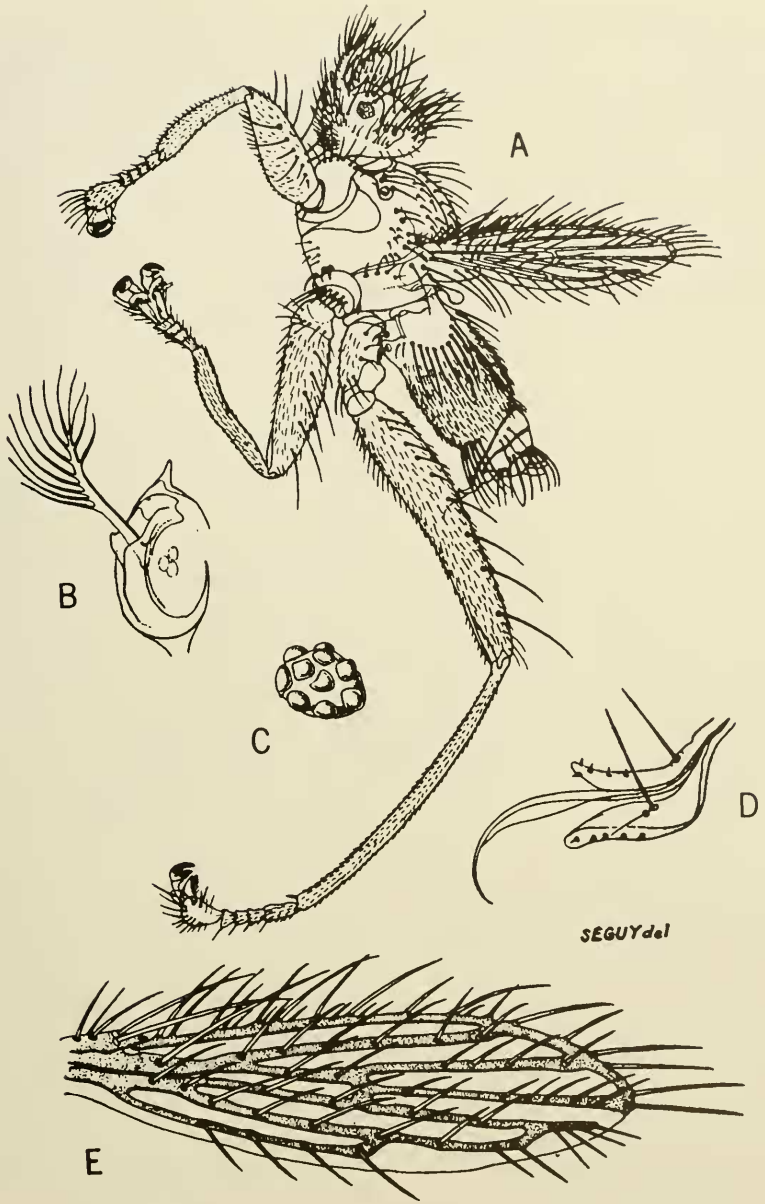

Fig. 38. *Megistopoda proxima* Séguy, male: A, lateral view; B, antenna; C, eye; D, male postgonites, spread out, ventral view; E, wing. From Séguy (1926).

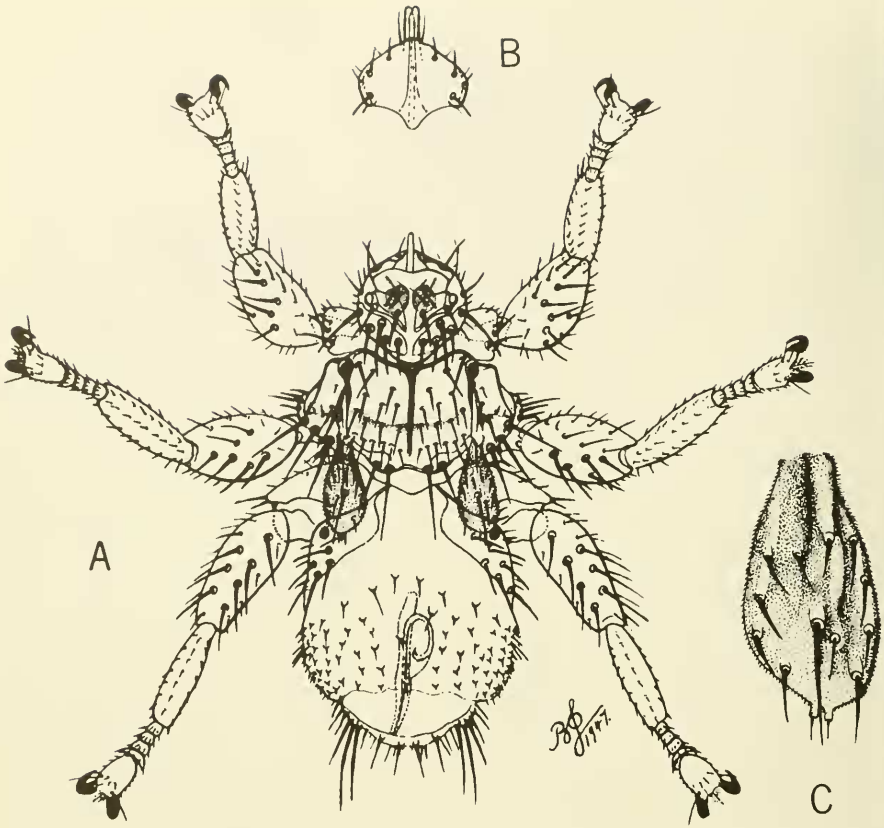

Fig. 39. *Mastoptera guimaraesi* Wenzel: A, male, dorsal view; B, labium; C, wing. From Jobling (1949; as *Aspidoptera minuta*).

ZULIA: 1 male, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 17-III-68.

Mastoptera species (*minuta* complex)

Specimens of the *minuta* complex from various hosts exhibit differences, often slight and overlapping, in the length and number of setae on various structures, in body measurements, and sometimes in the curvature of the male postgonites. However, the series presently available from some of the host species are not adequate for morphometric analysis of the entire complex.

Body measurements of specimens of *minuta* from *Phyllostomus hastatus* and *P. elongatus* that were taken in north central, eastern, and southern Venezuela clearly indicate that this population is distinct from any of those on species of *Tonatia*. I prefer not to name it at this time. However, if it is a distinct species, this explains the puzzling geographic and host distribution of the species of *Mastoptera* referred to by Wenzel et al. (op. cit., p. 518). It should be noted that a single specimen of this entity was taken from *P. hastatus* in Yaracuy (El Central), 11 km NW of Urama, where all other specimens taken from that host were *M. guimaraesi*. Distributional data for the species of *Strebla* that were taken from *P. hastatus*—as well as for species of *Noctiliostrebla*, *Paradyschiria*, and some other streblids—indicate that this is an area in which some parasite species that are characteris-

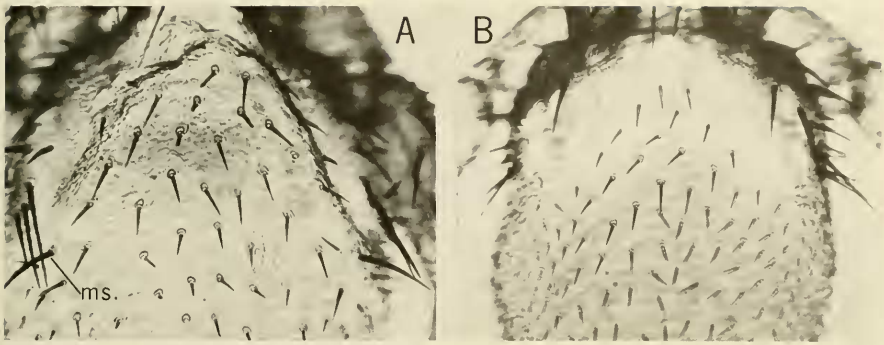

Fig. 40. A, *Mastoptera guimaraesi* Wenzel, and B, *Mastoptera minuta* (Lima); base of female abdomen, dorsal view. From Wenzel et al. (1966).

tic of different subspecies of the same host, or of allopatric host species, interdigitate or meet.

Venezuelan Survey Records (151 males, 149 females, 3 sex undet.)

T. F. AMAZONAS: 1 male and 1 female ex *Phyllostomus elongatus*, 2 males, 11 females, and 1 sex undet. ex *Phyllostomus hastatus*, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 14-IX–5-X-67; 11 males and 12 females, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 6-IX–10-X-67; 1 male ex *Tonatia brasiliensis*, 1 sex undet. ex *Tonatia silvicola*, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 8-X-67; 12 males and 5 females ex *Tonatia brasiliensis*, 1 male ex *Tonatia silvicola*, 3 males and 5 females ex 1 *Anoura* sp. A., 1 female ex *Artibeus fuliginosus*, 1 sex undet. ex *Artibeus lituratus*, 1 female ex *Artibeus jamaicensis*, 1 female ex *Phyllostomus elongatus*, 32 males and 32 females ex *Phyllostomus hastatus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-28-VII-67; 15 males and 14 females, same host, 14 males and 21 females ex *Tonatia silvicola*, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 29-30-V-67; 1 male and 1 female ex *Phyllostomus hastatus*, 19 males and 12 females ex *Phyllostomus elongatus*, 12 males and 7 females ex 1 *Tonatia carrikeri*, 2 females ex *Tonatia silvicola*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 4-14-IV-67; 2 males and 1 female ex *Tonatia silvicola*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I-67; 2 males and 3 females ex *Phyllostomus hastatus*, Río Orinoco, Tamatama, 135 m, 1-V-67.

TRUJILLO: 17 males and 12 females ex *Tonatia brasiliensis*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 15-IX-65; 4 males and 6 females, ex *Tonatia silvicola*, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 20-VIII–18-X-65.

YARACUY: 1 male and 1 female ex *Tonatia brasiliensis*, 1 male ex *Phyllostomus hastatus*, 11 km NW Urama, El Central, Urama, 25 m, 14-22-III-66.

ZULIA: 1 male ex *Tonatia silvicola*, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 17-III-68.

Genus *Aspidoptera* Coquillett

Aspidoptera Coquillett, 1894:334

Type Species: *Aspidoptera busckii* Coquillett, 1894:335 (= *Lipoptena phyllostomatis* Perty)

Lepopteryx Speiser, 1900:53

Type Species: *Lipoptena phyllostomatis* Perty, 1833:190

Key to Species of *Aspidoptera*

1. Upper portion of mesepisternum with 3-4 longitudinal rows of long setae 2
   Upper portion of mesepisternum (viewed from above) with 1-2 rows of longer setae similar to those of prescutum, but the outer (morphologically, lower) setae conspicuously shorter ..... *phyllostomatis* (Perty)

2. Male postgonites bent (Fig. 42B) but not falciform ..... *delatorrei* Wenzel
   Male postgonites strongly bent, falciform (Fig. 42A) ..... *falcata* n. sp.

Aspidoptera delatorrei Wenzel
(Fig. 42B)

Aspidoptera delatorrei Wenzel, 1966:557. Fig. 104B, D.

VENEZUELAN SURVEY RECORDS (7 males, 3 females ex 3 *Sturnira lilium*)

ZULIA: 3 males and 2 females, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 17-III-68; 3 males and 1 female, 21 km SW Machiques, Kasmera, 270 m, 17-IV-68; 1 male, 19 km WSW Machiques, Novito, 1,135 m, 29-IV-68.

Aspidoptera falcata, new species
(Fig. 42A)

Aspidoptera falcata is extraordinarily similar to *delatorrei* Wenzel, and, insofar as I have been able to determine, it differs invariably from that species only in its strongly falcate male postgonites. Females of the two species can be identified with some assurance only by association with the males. Females of *delatorrei* more frequently possess six or seven "discal" setae (in addition to the apical macrosetae) than they do four, on the supra-anal plate. The converse is true of females of *falcata*. Often only a single seta is present on each side, especially in *falcata*, and in this respect such specimens resemble *A. phyllostomatis*.

DESCRIPTION

With the characters of *Aspidoptera delatorrei* Wenzel, including the several longitudinal rows of long setae on upper portion of mesepisternum. FEMALE. Supra-anal plate occasionally with six, sometimes four discal setae, but commonly with only two (a single seta on each side), in addition to the distal macrosetae. MALE. Postgonites strongly falcate, their distal portion bent at right angles to the long axis of the hypandrium.

MEASUREMENTS

	Males	Females
BL	1.56-1.87	1.46-2.30
TL	0.47-0.53	0.49-0.55
WL	0.28-0.33	0.31-0.34
WW	0.20-0.23	0.22-0.26

TYPE DATA: Holotype male and allotype female ex *Sturnira lilium* (SVP 226), Venezuela, Dto. Federal, 4 km NNW Caracas, Los Venados, 1,539 m, 25-VII-65. PARATYPES (260 males, 258 females, 5 sex undet. ex 310 *Sturnira lilium*)—VENEZUELA. APURE: 27 males, 22 females, and 1 sex undet., 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 17-I—2-II-68. BARINAS: 7 males and 10 females, 2 km SW Altamira, Altamira, 611-620 m, 27-XII-67—4-I-68; 2 males and 1 female, 7 km NNE Altamira, Altamira, 1,070 m, 26-XII-67; 7 males and 6 females, Altamira, 794 m, 19-XII-67—9-I-68. BOLÍVAR: 5 males and 7 females, 56 km SE El Dorado, Km 67, El Manaco, 150 m, 16-VI-66; 17 males and 14 females, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 8-25-VI-66; 1 female, 67 km SSE El Dorado, nr. Río Danta, El Manaco, 150 m, 24-VI-66; 7 males and 3 females, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 29-IV—2-V-68; 3 males and 3 females, 85 km SSE El Dorado, Km 125, 1,032 m, 9-V-66; 4 males and 6 females, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66; 1 male and 2 females, 50 km SE El Manteco, Río Supamo, 150 m, 10-IV-66. CARABOBO: 1 male and 1 female, 2 km SE Montalbán, Potrerito, Montalbán, 598 m, 31-X—1-XI-67; 2 females, 3 km SW Montalbán, Hda. La Canada, Montalbán, 618 m, 22-XI-67; 3 males, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 28-XI-67; 1 female, 10 km NW Urama, El Central, Urama, 25 m, 15-XI-65. DTO. FEDERAL: 3 males, 1 female, and 1 sex undet., nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 19-21-VIII-66; 28 males and 36 females, same locality as holotype and allotype, except for 1,400-1,560 m, 30-VI—2-VIII-65. FALCÓN: 1 female, 84 km NW Carora, Cerro Socopito, 1,260 m, 17-V-68; 2 males and 4 females, 80 km NW Carora, Río Socopo, 470-480 m, 21-29-V-68; 21 males and 39 females, 19 km NW Urama, km 40, Urama, 25 m, 13-X-65—6-III-66. GUÁRICO: 1 male, 14 km SE Calabozo, nr. Río Orituco, Estacion Biologicas de los Llanos, 100 m, 21-VIII-68; 1 male, 9 km SE Calabozo, Estacion Biologicas de los Llanos, 100 m, 19-VIII-68; 4 males and 2 females, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66; 4 males and 2 females, 10 km N Altagracia, Río Orituco, 470 m, 20-IX-66. LARA: 1 male, 10 km N El Toeuyo, Caserio Boro, El Tocuyo, 528 m, 14-VII-68. MIRANDA: 1 male and 1 female, 1 km S Río Chico, 1 m, 25-X—2-XI-66; 3 males and 1 female, Birongo, 60 m, 22-I-68; 2 males, 5 km NNW Guarenas, Curupao, 1,120-1,180 m, 13-14-X-66; 6 males and 3 females, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 22-IX—2-X-66. MONAGAS: 2 males and 3 females, 3 km NW Caripe, nr. San Agustín, 1,165-1,275 m, 4-11-VII-67; 1 male and 2 females, 5 km NW Caripe, San Agustín, 1,160-1,170 m, 3-5-VII-67. SUCRE:

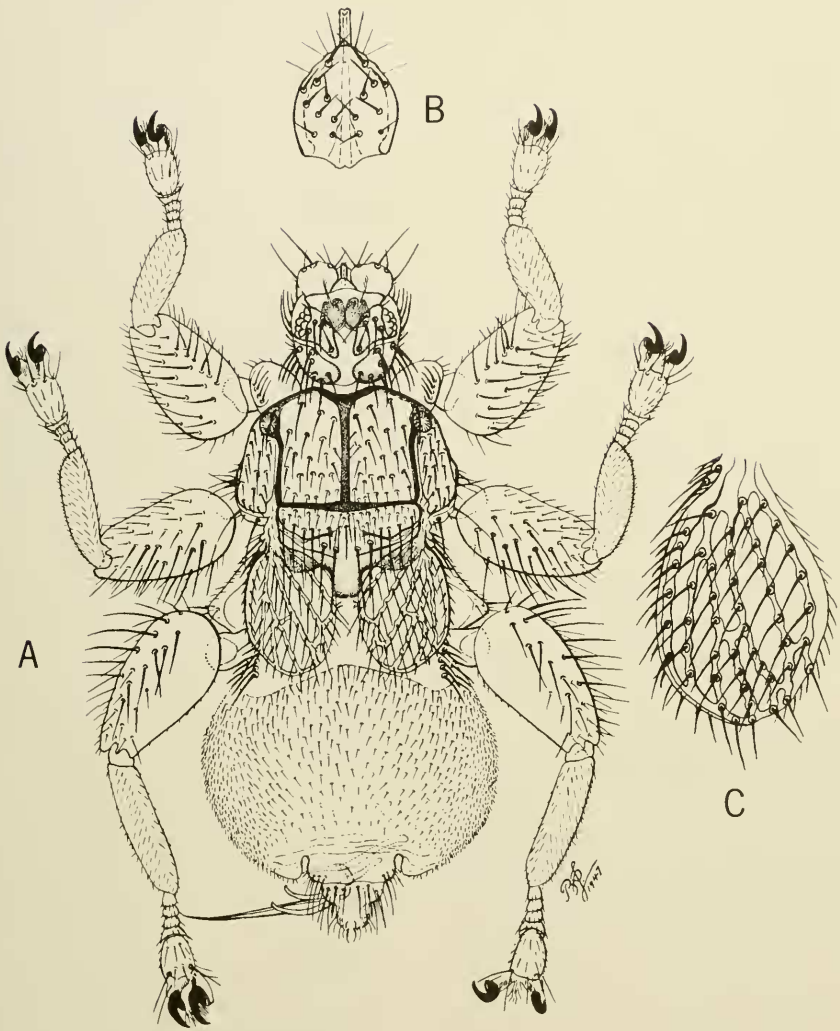

Fig. 41. *Aspidoptera phyllostomatis* (Perty): A, male, dorsal view; B, labium; C, wing. From Jobling (1949).

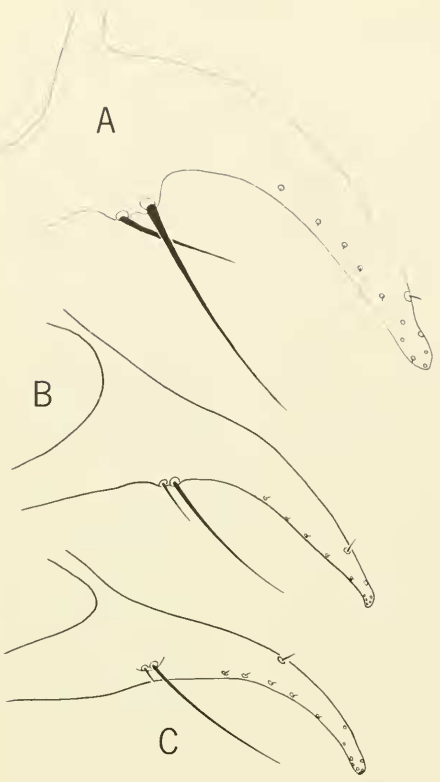

Fig. 42. Male Postgonites: A, *Aspidoptera falcata*, new species (SVP 2184); B, *Aspidoptera delatorrei* Wenzel; C, *Aspidoptera phyllostomatis* (Perty). B-C from Wenzel et al. (1966).

1 male and 1 female, 16 km E Cumaná, 1 m, 7-XII-66; 1 male and 2 females, 21 km E Cumaná, 1-15 m, 14-23-XII-66; 6 males and 2 females, 11 km NE Güiria, Ensenada Cauranta, 75 m, 10-VI-67; 6 males and 1 female, 12 km NE Güiria, Ensenada Cauranta, 90 m, 17-19-VI-67; 5 males and 8 females, 9 km NE Güiria, Ensenada Cauranta, 1-4 m, 4-15-VI-67; 1 female, 26 km ESE Carúpano, Manacal, 175 m, 27-VII-67. T. F. AMAZONAS: 1 female, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 2-II-67; 1 male and 1 female, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 2-10-II-67; 14 males and 7 females, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 13-IX–6-X-67; 2 males, 28 km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-X-67; 3 males, 30 km S Pto. Ayacucho, Coromoto, Pto. Ayacucho, 126 m, 8-9-X-67; 4 males and 4 females, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 6-7-IX-67; 10 males and 7 females, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 6-24-VII-67. TRUJILLO: 2 males and 8 females, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 3-IX–7-X-65; 1 male and 2 females, 23 km N Valera, nr. Agua Viva, Valera, 164 m, 17-IX-65; 1 male and 4 females, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 15-VIII-18-X-65. YARACUY: 5 males and 6 females, 10 km NW Urama, El Central, Urama, 25 m, 8-14-III-66; 1 female, 11 km NW Urama, El Central, Urama, 25 m, 14-III-66. ZULIA: 7 males and 5 females, 39 km WNW Encontrados, El Rosario, 37 m, 31-III–1-IV-68; 5 males, 7 females, and 1 sex undet., 42 km WNW Encontrados, El Rosario, 24 m, 3-5-III-68; 22 males, 16 females, and 2 sex undet., 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 17-20-III-68; 1 female, 19 km WSW Machiques, Novito, 1,135 m, 5-V-68.

OTHER VENEZUELAN SURVEY MATERIAL EXAMINED (130 males, 115 females, and 1 sex undet.)

APURE: 1 male ex 1 *Carollia perspicillata*, 1 female ex *Sturnira ludovici*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 17-I–2-II-68.

BARINAS: 5 males and 10 females ex *Sturnira ludovici*, 2 km SW Altamira, Altamira, 611-620 m, 26-XII-67–3-I-68; 2 males and 1 female, same host, Altamira, 794 m, 21-XII-67–10-I-68.

BOLÍVAR: 1 male ex 1 *Artibeus cinereus*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 25-VI-66; 6 males ex *Sturnira tildae*, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 30-IV–2-V-68; 3 males and 3 females, same host, 85 km SSE El Dorado, Km 125, 1,032-1,165 m, 9-23-V-66.

CARABOBO: 1 female ex *Sturnira ludovici*, 13.5 km NE Montalbán, La Voluntad, Montalbán, 1,007 m, 2-XI-67; 1 male, same host, 2 km SE Montalbán, Potrerito, Montalbán, 598 m, 31-X-67; 4 males and 3 females, same host, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 29-XI-67.

DTO. FEDERAL: 1 male ex 1 *Vampyrops umbratus*, 5 km NW Caracas, nr. Clavelitos, Boca Tigre Valley, 1,394 m, 27-VIII-65; 1 female ex 1 *Sphaeronycteris toxophyllum*, 2 males ex

Sturnira ludovici, 4 km NNW Caracas, Los Venados, 1,400-1,507 m, 23-VII—2-VIII-65; 1 male, same host, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 20-VIII-66.

GUÁRICO: 6 males and 9 females ex *Sturnira ludovici*, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66.

MIRANDA: 4 males and 2 females ex *Sturnira ludovici*, Birongo, 60 m, 22-I-68; 6 males and 6 females, same host, 5 km NNW Guarenas, Curupao, 1,160 m, 5-13-X-66; 15 males and 10 females, same host, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 22-24-IX-66; 1 female, same host, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,124 m, 12-IX-65.

MONAGAS: 1 male and 1 female ex *Sturnira ludovici*, 3 km NW Caripe, nr. San Agustín, 1,345 m, 11-VII-67.

SUCRE: 1 female ex *Sturnira tildae*, 12 km NE Güiria, Ensenada Cauranta, 90 m, 17-VI-67; 1 female ex *Artibeus jamaicensis*, 21 km E Cumaná, 1 m, 10-XII-66.

T. F. AMAZONAS: 1 female ex *Artibeus jamaicensis*, 1 male ex 1 *Phyllostomus hastatus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 24-27-VII-67; 1 male and 1 female ex 2 *Artibeus fuliginosus*, 29 males and 28 females ex *Sturnira tildae*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150-155 m, 1-1—2-II-67; 27 males and 25 females, same host, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 2-3-II-67; 5 males and 3 females, same host, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 6-III-67; 1 male, same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 29-V-67; 7 males, 4 females, and 1 sex undet., same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 14-IV-67; 1 female, same host, Río Orinoco, Tamatama, 135 m, 30-IV-67.

YARACUY: 1 female ex 1 *Uroderma bilobatum*, 10 km NW Urama, El Central, Urama, 25 m, 14-III-66.

Host Associations

Of 755 specimens of *Aspidoptera falcata* collected by the survey teams, 520 (69 percent) were from 310 *Sturnira lilium*, 143 (19 percent) were from 61 *Sturnira tildae*, 92 (12 percent) were from 54 *Sturnira ludovici*, and 8 (1 percent) were from 8 bats of 6 other species.

Of interest is the fact that *A. falcata* was collected from *S. lilium* at each of the three localities in Zulia at which *A. delatorrei* was taken, but not from the same individual bats.

Remarks

I have restricted the type series of *Aspidoptera falcata* to specimens taken from *Sturnira lilium*, although specimens were commonly taken from *S. ludovici* and *S. tildae*.

The regular occurrence of *A. falcata* on three of the six species of *Sturnira* that were collected in Venezuela is interesting when compared with the host distribution of the closely related *delatorrei* in Central America (Wenzel et al., 1966). The type series of *delatorrei*, though small, were all taken from *Sturnira lilium parvidens* in Panama, Guatemala, and Mexico. None were taken from *S. ludovici*, although 50 percent of the 89 Panamanian specimens of this host that were examined for parasites were positive for Streblidae. However, *Trichobius brennani* Wenzel—a species that was not collected in Venezuela—was taken from almost 19 percent of those Panamanian specimens of *ludovici* that were parasitized by streblids. The absence of *brennani* in Venezuela is certainly not an "artifact of collecting," since 342 specimens of *ludovici* were examined for parasites, and more than 40 percent of these were positive for Streblidae. Interestingly, in Venezuela no specimens of *Aspidoptera* were taken from *Sturnira erythromos*, *S. bogotensis*, or *S. bidens*. Instead, these hosts were parasitized by a species of *Trichobius*—*Sturnira erythromos* and *S. bogotensis* by *Trichobius petersoni* n. sp. and *S. bidens* by *T. hispidus* n. sp. It should be noted that species of *Megistopoda* were taken from all of these hosts excepting *S. bidens*. The failure to retrieve a *Megistopoda* species from *S. bidens* may be due to inadequate sampling, since only 16 specimens of this bat were collected and 14 examined for parasites.

Aspidoptera phyllostomatis (Perty)

(Fig. 41, 42C)

Lipoptena phyllostomatis Perty, 1833:190, Pl. 37, Fig. 17

Aspidoptera phyllostomatis Jobling, 1949:137, Fig. 1.—Wenzel, Tipton, and Kiewlicz, 1966: 553, Fig. 103

Aspidoptera busckii Coquillett, 1899:335.—Wenzel, Tipton, and Kiewlicz, 1966:555. *New synonym.*

Wenzel et al. (loc. cit.) designated a male specimen figured by Jobling (loc. cit.) as the neotype of *Aspidoptera phyllostomatis* (Perty). They illustrated the postgonites of another male that was collected with the neotype and of a male of *Aspidoptera busckii* Coquillett. Though otherwise inseparable, these appeared to be distinct in the shape of the postgonites and for this reason were treated as distinct species. I have reexamined these specimens of *phyllosto-*

matis as well as a number of slide preparations of *A. busckii* and have concluded that the differences figured resulted from differences in orientation in the slide preparations, and possibly from some crushing of the postgonites in the single genital preparation of *A. phyllostomatis*. I now agree with Jobling (loc. cit.) that *busckii* is a synonym of *phyllostomatis*.

VENEZUELAN SURVEY RECORDS (189 males, 166 females, 5 sex undet.)

Aspidoptera phyllostomatis was taken in 14 states in 48 localities, wherever *Artibeus jamaicensis*, its characteristic host, occurred, as follows: Apure (1 locality, 24 m); Barinas (2 localities, 609-794 m); Bolívar (3 localities, 190-851 m); Carabobo (4 localities, 598-1,537 m); Falcón (5 localities, 2-480 m); Guárico (1 locality, 630 m); Lara (1 locality, 528 m); Miranda (5 localities, 1-1,180 m); Monagas (2 localities, 1,160-1,170 m); Sucre (5 localities, 1-175 m); T. F. Amazonas (6 localities, 119-150 m); Trujillo (5 localities, 29-164 m); Yaracuy (1 locality, 395 m); Zulia (7 localities, 24-1,135 m).

HOST ASSOCIATIONS

Of 359 specimens of *Aspidoptera phyllostomatis* collected by the survey teams, 343 (95.5 percent) were from 227 *Artibeus jamaicensis*, and the remaining 16 specimens were from 14 bats of the following 7 species: *Anoura caudifer*, *Artibeus fuliginosus*, *A. lituratus*, *Glossophaga soricina*, *Phyllostomus hastatus*, *Pteronotus parnellii* and *Uroderma bilobatum*.

Genus *Exastinion* Wenzel

Exastinion Wenzel, 1966:558

TYPE SPECIES: *Aspidoptera clovisi* Pessôa and Guimarães, 1937:262

This genus was erected to accommodate a single species, *Aspidoptera clovisi*. Pessôa and Guimarães (loc. cit.) described and figured *clovisi* as having a single large eye facet, as did Jobling (1949:138, Fig. 2). Wenzel et al. (1966: 560) noted this and pointed out that in all of their slide preparations of *clovisi* the eyes had five to six facets. By coincidence all these slides were of specimens from *Anoura cultrata*.[7] Restudy of their material shows that the specimens with faceted eyes, from *A. cultrata*, represent an undescribed species and also reveal the existence of another undescribed species with faceted eyes. Thus, the Panamanian and Venezuelan specimens which they recorded from *A. cultrata* are *Exastinion oculatum* n. sp., the Panamanian specimens from *A. geoffroyi* are *E. clovisi* (as are the Guatemalan and Trinidadian specimens which they alluded to), and the Colombian and Ecuadorian specimens which they mentioned are *E. deceptivum* n. sp.

Key to the Species of *Exastinion*

1. Eyes with a single large facet. Scutum with 8 setae. FEMALE. Ventral arc with distinct laterally projecting flanges (visible only in slide preparations) ..... *clovisi* Pessôa and Guimarães

   Eyes with 5-6 very small facets. FEMALE. Ventral arc without laterally projecting flanges 2

2. Scutum with 10 setae. Sternum 2 densely setose, the median discal setose area extending anteriorly nearly to base ..... *oculatum* n. sp.

   Scutum with 15-16 setae. Sternum 2 with fewer setae, the setose area extending anteriorly only to midlength or slightly beyond ..... *deceptivum* n. sp.

Exastinion clovisi (Pessôa and Guimarães)

(Fig. 43A-C)

Aspidoptera clovisi Pessôa and Guimarães, 1937: 262, Fig. 5, 6

Exastinion clovisi, Wenzel, Tipton, and Kiewliez, 1966:560, part, Fig. 105A-D and records from *Anoura geoffroyi*

The following may be added to the description of Pessôa and Guimarães (loc. cit.):

Head. Underside of palpi usually setose on less than basal half. *Thorax.* Scutum typically with 8 setae. Metasternal lobe well developed, longer than broad. *Abdomen.* Lateral lobes of tergum 1+2 with ± 15 macrosetae and ± 18 short setae. Sternum 2 with setose area extending anteriorly to near or slightly beyond midlength. FEMALE. Dorsolateral abdominal connexivum with a cluster of ± 5 setae that are a little longer than the short setae following, which become slightly shorter apically. Seventh sternites with 17-18 setae, ± 12 of these macrosetae or of intermediate length, the others short. MALE. Sternum 7+8 with ± 10 setae on each

[7] The Venezuelan specimens were recorded as being from *Anoura caudata*, an unfortunate misspelling on the original labels for *A. cultrata*.

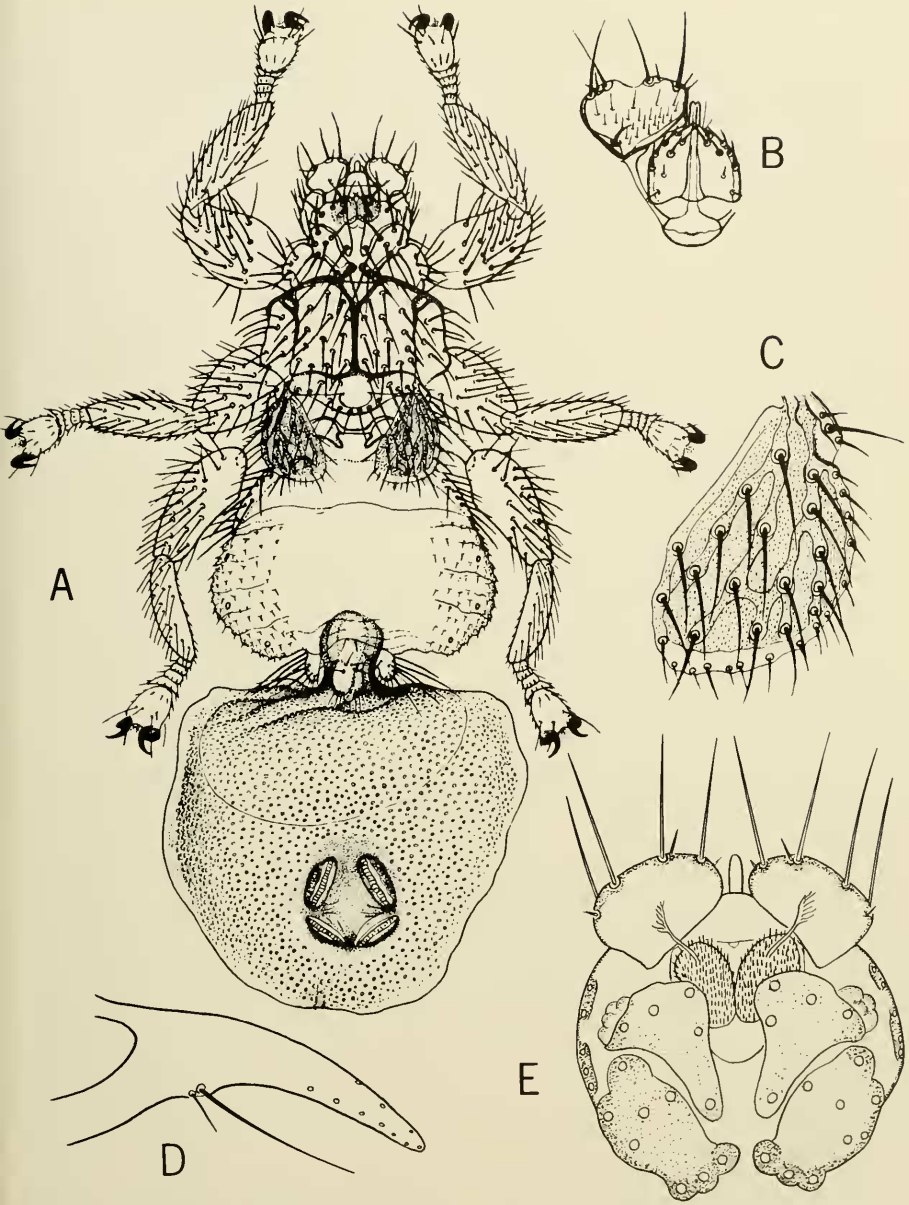

Fig. 43. A-C, *Exastinion clovisi* Pessôa and Guimarães: A. female, with extruding puparium, dorsal view; B, labium and palpus; C, wing. D-E. *Exastinion oculatum*, new species: D, left male postgonite; E. head, dorsal view, setae omitted. A-C from Jobling (1949); D-E from Wenzel et al. (1966; as *Exastinion clovisi*).

side, 3 of the ventral setae shorter or short, the rest of them macrosetae. Tergum 9 with 16 setae, mostly macrosetae, which on each side become shorter ventrally.

Venezuelan Survey Records (181 males, 158 females, 1 sex undet.)

BARINAS: 1 female ex *Anoura caudifera*, 2 males ex *Anoura geoffroyi*, 2 km SW Altamira, Altamira, 609-611 m, 31-XII-67—3-I-68; 1 male and 1 female, same host, Altamira, 794 m, 20-XII-67.

BOLÍVAR: 11 males and 6 females ex *Anoura geoffroyi*, 6 males and 3 females ex *Anoura* sp. A, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 9-23-VI-66; 10 males and 8 females, same host, 18 males and 19 females ex *Anoura geoffroyi*, 85 km SSE El Dorado, Km 125, 1,032-1,165 m, 10-26-V-66; 4 males and 3 females, same host, 20 km W La Paragua, Hato San José, 300-306 m, 4-10-IV-67; 3 males and 1 female, same host, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 7-V-68; 4 males and 2 females ex *Anoura* sp. A, 50 m, 4-V-67.

CARABOBO: 6 males and 7 females ex *Anoura caudifera*, 2 males and 4 females ex *Anoura geoffroyi*, 4 males and 4 females ex *Anoura* sp. A, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 26-30-XI-67; 2 males and 3 females ex *Anoura geoffroyi*, 2 km SE Montalbán Potrerito, Montalbán, 598 m, 1-XI-67.

DTO. FEDERAL: 2 males and 1 female ex *Anoura* sp. A, 4 km NNW Caracas, Los Venados, 1,465-1,524 m, 28-VII—15-VIII-65; 7 males and 4 females, same host, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,150-2,240 m, 18-VIII—1-IX-65; 1 female, same host, 6 km NNW Caracas, nr. Boca Tigre, Pico Ávila, 2,025 m, 30-VIII-65.

FALCÓN: 4 females ex *Anoura geoffroyi*, 14 km ENE Mirimire, nr. La Pastora, 60-122 m, 21-27-XI-67; 1 male and 1 female, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 30-XI-67.

GUÁRICO: 3 males ex *Anoura geoffroyi*, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66.

MIRANDA: 1 female ex *Anoura geoffroyi*, Birongo, 60 m, 22-I-68.

MONAGAS: 7 males and 3 females ex *Anoura geoffroyi*, 5 km NW Caripe, San Agustín, 1,150-1,170 m, 25-VI—6-VII-67.

SUCRE: 2 males ex *Anoura geoffroyi*, 1 male and 1 female ex *Anoura* sp. A, 26 km ESE Carúpano, Manacal, 366 m, 19-VII-67; 34 males and 20 females ex *Anoura geoffroyi*, 9 km NE Güiria, Ensenada Cauranta, 7 m, 13-16-VI-67.

T. F. AMAZONAS: 1 male and 1 female ex *Peropteryx macrotis*, 1 male and 1 female ex *Anoura geoffroyi*, 30 km S Pto. Ayacucho, Platanilla, Pto. Ayacucho, 119 m, 12-13-X-67; 8 males and 15 females, same host, 21 males, 26 females, and 1 sex undet. ex *Anoura* sp. A, 1 female ex 1 *Artibeus jamaicensis*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 21-28-VII-67; 11 males and 10 females ex *Anoura geoffroyi*, Cabecera del Caño Culebra, 40 km NNW Esmeralda, 1,200-1,400 m, 4-8-II-67; 2 males and 2 females, same host, 14 km SSE Pto. Ayacucho, El Gavilan, Pto. Ayacucho, 135 m, 11-X-67; 5 males and 4 females, same host, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 21-IX-67.

ZULIA: 1 male ex *Peropteryx macrotis*, 1 male ex *Anoura geoffroyi*, 21 km SW Machiques, Kasmera, 270 m, 15-IV-68.

Remarks

There are slight differences in body and wing measurements between specimens of *Exastinion clovisi* from *Anoura geoffroyi, A. caudifer*, and *Anoura* sp. A. However, these do not appear to be statistically significant, and I cannot detect any other differences, e.g., in chaetotaxy or structure of the male postgonites. I provisionally refer all of these specimens to *clovisi*, though *A. caudifer* does not share any other streblids with other species of *Anoura*. Further analysis of these collections seems desirable.

Exastinion oculatum, new species
(Fig. 43D, E)

Exastinion clovisi, Wenzel, Tipton, and Kiewlicz, 1966:560, in part (Fig. 105B, E, and records from *Anoura cultrata*), not Pessôa and Guimarães, 1937

Aside from having faceted eyes, *Exastinion oculatum* n. sp. is distinct from *clovisi* in its intensively setose sternum 2, the setose area extending nearly to base rather than to middle or slightly beyond; in the more extensive setation of the underside of the palpi, and in possessing 10 rather than 8 scutal setae. For differences between *oculatum* n. sp. and *deceptivum* n. sp., see *deceptivum* n. sp., below.

The published descriptions and figures of *E. clovisi* (see above) apply equally well to *oculatum* n. sp., except as follows.

Description

Head. Eyes with 5-6 small facets. Palpi with numerous short setae on slightly more than basal half. *Thorax*. Scutum typically with 10 long setae, 5 on each side. Metasternal lobe

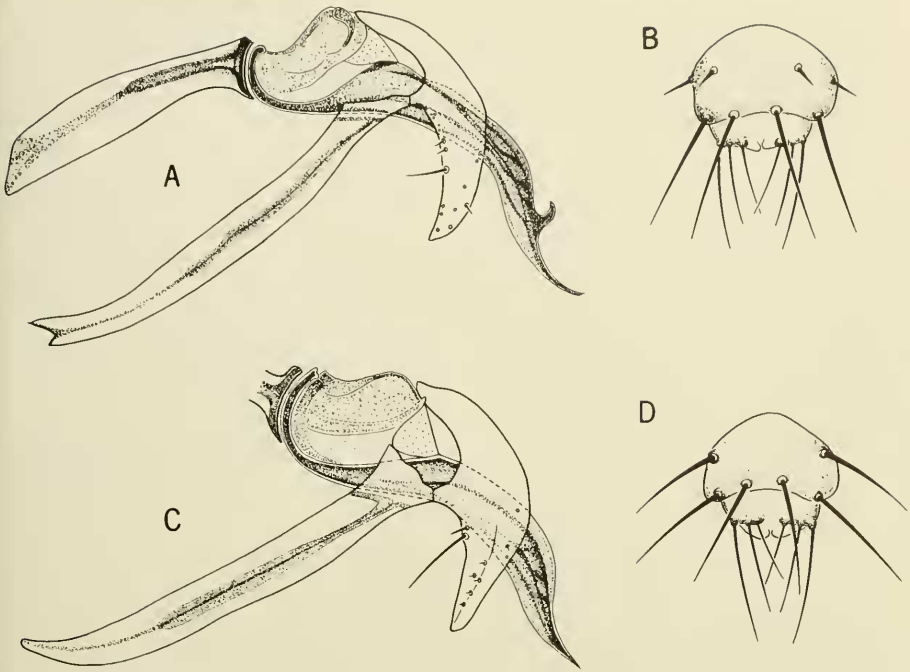

Fig. 44. *Noctiliostrebla aitkeni* Wenzel: A, female, dorsal view; B, labium; C, wing. From Jobling (1949; as *Aspidoptera megastigma*).

short, usually broader than long. *Abdomen.* Lateral lobes of tergum 1+2 with ± 17 long macrosetae, ± 5 shorter setae ventral to these, and below these 13-15 shorter setae (these longer than in *deceptivum*). Sternum 2 with thornlike setae, the setose area extending anteriorly nearly to base; setae along posterior margin of nearly the same size as those on disc, but those around posterior angles much longer, several of them macrosetae. Lateral lobes of tergum 1+2 each with ± 17 macrosetae dorsally, and ventral to these ± 5 shorter macrosetae and 13-15 short setae, these much longer and more conspicuous than in *E. deceptivum* n. sp. Female. Dorsolateral abdominal connexivum with a cluster of 10-12 conspicuous setae, some of them 2-3 times as long as those following, these becoming shorter distally, the apical ones very short. Seventh sternites with ± 18 setae, ± 12 of these macrosetae, the others shorter or short. Male. Sternum 7+8 with ± 12 setae, the upper ones macrosetae, the others becoming shorter ventrally. Tergum 9 with ± 15 setae, the more dorsal ones macrosetae, the others becoming shorter ventrally.

Measurements

	Males	Females
BL	1.08-1.54	1.31-1.57
TL	0.39-0.47	0.44-0.47

Type Data: Male holotype (FMNH) and female allotype (FMNH) ex *Anoura cultrata* (Tipton-Handley 10399), Panamá, Chiriquí, Cerro Punta, Casa Tilley, 5,300-5,600 ft, 12-III-62, C. M. Keenan and V. J. Tipton. Paratypes—PANAMÁ. Bocas del Toro: 7 males and 5 females ex *Anoura cultrata*, 2,500 ft., 27-IX-61, C. M. Keenan and V. J. Tipton. Chiriquí: 1 male, same data as the holotype. Darién: 12 males and 7 females ex *Anoura cultrata*, Cerro Tacarcuna, 4,100-4,800 ft., 21-II—10-III-64, C. O. Handley, Jr.; 8 males and 7 females, same host, Cerro Malí, 2-II-64, 4,100-4,800 ft., C. O. Handley, Jr. VENEZUELA. Aragua: 5 males and 3 females ex *Anoura cultrata*, Rancho Grande, El Limón,

3,576 ft., 30-III-60, C. O. Handley, Jr. MÉRIDA: 1 male and 1 female ex *Anoura cultrata* (SVP), 6 km SE La Azulita, La Carbonera, 1,870 m, 23-IV-66. MIRANDA: 1 male ex *Anoura cultrata* (SVP), 4 km SW Birongo, Cueva Walter Dupouy, Birongo, 195 m, 28-I-68.

Exastinion deceptivum, new species

Exastinion deceptivum n. sp. resembles *oculatum* n. sp. in having 5-6 eye facets, but differs conspicuously in having 15 rather than 10 scutal setae.

As with *E. oculatum* n. sp., the description and figures of *E. clovisi* Pessôa and Guimarães generally applies to *deceptivum*, too. The following description includes those characters in which *deceptivum* differs or those that were not mentioned in the description of *clovisi*.

DESCRIPTION

Head. Eyes small, typically with 6 facets. Underside of palpi setose on ± basal half. *Thorax.* Scutum with 15-16 setae. Metasternal lobe well developed, longer than broad as in *clovisi*. *Abdomen.* Lateral lobes of tergum 1+2 with 17-20 long macrosetae and 15-17 short setae. Sternum 2 with median setose area extending anteriorly to or slightly beyond midlength. Dorsolateral connexivum with a cluster of 10-12 longer setae behind lateral lobes of tergum 1+2, the setae following them shorter but not conspicuously so, becoming only slightly shorter distad, the distal ones longer than in either *clovisi* or *oculatum*. Seventh sternites with ± 16 setae, including ± 8 macrosetae, ± 6 short setae, and ± 2 of intermediate length. MALE. Sternum 7+8 typically with 7 setae, 5-6 of them macrosetae. Tergum 9 with 16-17 setae, including macrosetae, the ventral ones shorter.

MEASUREMENTS

	Males	Females
BL	1.52-1.64	1.74-2.06
TL	0.47-0.52	0.50-0.54

TYPE DATA: Male holotype (FMNH) and female allotype (FMNH) ex *Anoura geoffroyi peruana* (CJM 4934), Colombia, Cundinamarca: 12 km NNE of Bogotá, La Calera, 23-IV-66, C. J. Marinkelle. PARATYPES—COLOMBIA. ANTIOQUIA: 4 males and 5 females (FMNH) ex *Anoura geoffroyi*, Urrao, Paramo de Frontino, 3,100 m, 2-III-51, P. Hershkovitz (FMNH Colombian Zool. Exped.). CUNDINAMARCA: 2 females ex *Anoura geoffroyi*, Zipaquira, Paramo de Guerrero, 3,150 m, 3-VI-52, P. Hershkovitz (FMNH Colombian Zool. Exped.); 4 males and 1 female (FMNH), same data as the holotype; 2 males and 1 female (MCZ) ex *Anoura geoffroyi apolinari* [= *peruana*], Bogotá, H. Osorno. ECUADOR. AZUAY: 3 males and 1 female (AMNH) ex *Anoura geoffroyi peruana*, Cuenca, 13-VII-22. VENEZUELA. MÉRIDA: 4 males and 5 females ex 3 *Anoura geoffroyi*, Tabay, 6 km ESE Tabay, Middle Refugio, 2,550 m, 15-IV-66; 3 males, same host, La Carbonera, 12 km SE La Azulita, 2,190 m, 21-IV-66. MIRANDA: 2 females ex *Anoura geoffroyi*, Curupao, 5 km NNW Guarenas, 1,160 m, 6-X-66. MONAGAS: 2 males and 5 females ex *Anoura geoffroyi*, San Agustín, 5 km NW Caripe, 1,160-1,165 m, 27-VI—3-VII-67.

OTHER MATERIAL EXAMINED:

Colombia. Nariño: 1 male ex *Sturnira bidens*, 6,000 ft., 12-VI-70, Kjell von Sneidern; 1 male ex *Artibeus* sp., La Victoria, 8,000 ft., 16-V-70, K. von Sneidern.

REMARKS

Both *Exastinion clovisi* Pessôa and Guimarães and *E. deceptivum* n. sp. were taken from bats identified as *Anoura geoffroyi*. Unfortunately, the Venezuelan bats were not identified to subspecies, but the Colombian records of *deceptivum* from *A. geoffroyi peruana* suggest that the Venezuelan hosts of this fly may also have been *A. g. peruana*. However, the host species or subspecies of *Anoura* may be less important than altitude in determining the distribution of *clovisi* and *deceptivum*. *Exastinion clovisi* has been taken from *A. g. geoffroyi*, *A. g. lasiopyga*, and *A. caudifera* at generally much lower elevations than those at which most specimens of *deceptivum* were collected.

Genus *Noctiliostrebla* Wenzel

Noctiliostrebla Wenzel, 1966:560

TYPE SPECIES: *Lipoptena dubia* Rudow, 1871:122

The species of *Noctiliostrebla*, like those of *Paradyschiria* (see below), are characteristic parasites of the fish-eating bats of the genus *Noctilio*. *Noctilio labialis* is normally parasitized by *Noctiliostrebla maai*, at least in Central America and northern South America. In Venezuela, *Noctilio leporinus* is parasitized by at least three species of *Noctiliostrebla*—by *N. traubi* Wenzel in northwestern Venezuela; by *N. aitkeni* Wenzel in the eastern half; and in the far south of T. F. Amazonas by *N. dubia*

(Rudow) and *N. aitkeni* Wenzel, where at two localities in Amazonas, individual host specimens were found that were parasitized by both these species. Specimens of *dubia* and *aitkeni* were also found together on several individual bats of a series of *Noctilio leporinus* that were taken in Amazonian Brazil (Para; Río Tapajoz, Ilha de Urucurituba, A. M. Olalla).

Key to Venezuelan Species of *Noctiliostrebla*

Males

1. Posterior margin of sternum 2 strongly produced apically, the median marginal setae forming a pseudoctenidium (Fig. 45C) ..... *traubi* Wenzel
   Posterior margin of sternum 2 straight or feebly arcuate, sometimes feebly emarginate along middle (Fig. 45D) 2
2. Sternum 2 nearly flat or evenly convex at middle, setae normal. Median wing vein usually with 1 or 2 setae 3
   Sternum 2 strongly tumid in an elongate, roughly triangular area along midline, this area covered with numerous short, often thornlike setae (Fig. 45E), those along margin of this median area shorter than those lateral to them and often thornlike. Median wing vein with 2-4 (usually 3) setae ..... *dubia* (Rudow)
3. Ventral processes of hypopygium flared at apex ..... *aitkeni* Wenzel
   Ventral processes of hypopygium with weak, knoblike apices ..... *maai* Wenzel

Females

1. Posterior margin of sternum 2 emarginate at middle 2
   Posterior margin of sternum 2 feebly outwardly arcuate or nearly straight 3
2. Sternum 2 shorter, not deeply emarginate (Fig. 45A). Median wing vein without setae ..... *traubi* Wenzel
   Sternum 2 very long and deeply emarginate, the emargination extending anteriorly beyond midlength. Median wing vein with 2-4 (usually 3) setae ..... *dubia* (Rudow)
3. Dorsal abdominal connexival setae of relatively uniform length, excepting a cluster of 14-16 longer (but not strikingly longer) and stronger setae on each side behind the lateral lobes of tergum 1+2 and 1 or 2 pairs of much longer, strong setae at apex of setose area ..... *maai* Wenzel
   Dorsal abdominal connexivum with a basal cluster ± 12 very long, conspicuously stronger setae on each side behind lateral lobes of tergum 1+2, these continued on each side as a longitudinal band of shorter setae which, however, are distinctly longer than the setae along middle and sides of connexivum (in gravid specimens this longitudinal band breaks up into groups that are situated medial to the spiracles) ..... *aitkeni* Wenzel

Noctiliostrebla dubia (Rudow)

(Fig. 45E)

Lipoptena dubia Rudow, 1871:122
Noctiliostrebla dubia Wenzel, Tipton, and Kiewlicz, 1966:563
Lepopteryx megastigma Speiser, 1900:54, Pl. 3, Fig. 2, new synonym
Noctiliostrebla megastigma Wenzel, Tipton, and Kiewlicz, 1966:564

Earlier, Wenzel et al. (loc. cit.) examined the types of *Lipoptena dubia* Rudow, which were made available through the courtesy of Prof. Herbert Weidner of the Hamburg Museum. The Venezuelan specimens recorded below compare well with descriptive notes and illustrations of *dubia* made at that time.

In general, *Noctiliostrebla dubia* Rudow has the characters of *N. traubi* (Wenzel). As in that species, sternum 2 of the female is large and apically emarginate. The ventral processes of the male hypopygium and the male terminalia are similar, including the presence of a dorsal, subapical, thornlike spine on the aedeagus. The females differ conspicuously in the shape and emargination of the second abdominal sternum (see key) and in the dorsal abdominal chaetotaxy. In *traubi*, the dorsal connexivum possesses a cluster of seven to eight longer and coarser setae behind the lateral lobes of tergum 1+2;

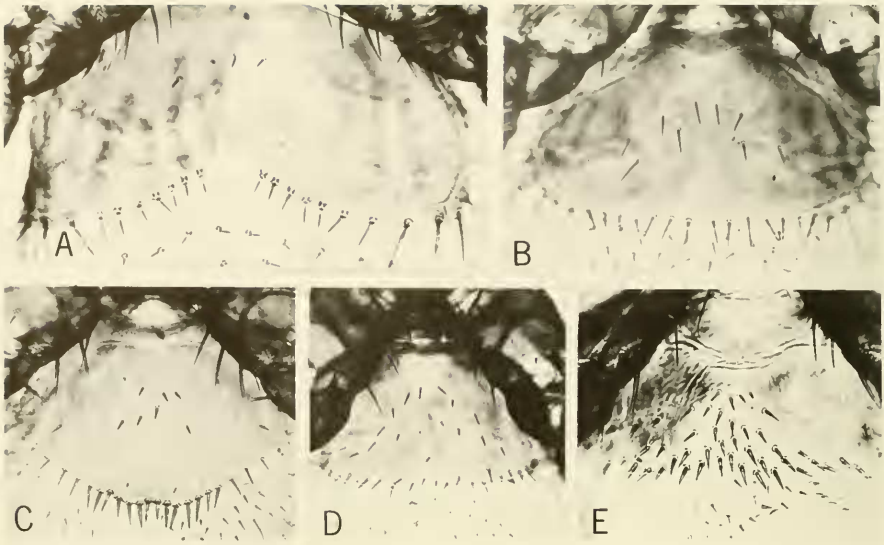

Fig. 45. A, C, *Noctiliostrebla traubi* Wenzel: A, sternum 2, female; C, sternum 2, male. B, D, *Noctiliostrebla maai* Wenzel: B, sternum 2, female; D. sternum 2, male. E, *Noctiliostrebla dubia* (Rudow): sternum 2, male.

elsewhere it is rather uniformly clothed with much shorter setae, but these are longer than those along lateral margins and venter; a few longer setae are also present near apex. In *dubia,* the setae of the cluster behind the lateral lobes of tergum 1+2 are longer than in *traubi* and are continued along the length of the dorsum on each side as a longitudinal band of only slightly shorter setae, these conspicuously longer than in *traubi;* setae of the median area are much shorter. Other differences between *dubia* and *traubi* are given in the key.

Through the kindness of Dr. H. Schumann of the Berlin Museum and Dr. Karel Hurka of Charles University (Prague), I have also been able to examine one male and two females of Speiser's type series of five *Lepopteryx megastigma.* These specimens, which were without locality and originally mounted dry on cards, are now preserved in glycerin. They are in very poor condition.

The vial contains a label "Lecto-holotype/ of *megastigma*/Speis. [= *dubia*/Rudow]/ ♀ / T. C. Maa 1962," but there are two females. One of these, which is in better condition, appears to be *Noctiliostrebla traubi* Wenzel. The middle wing veins of this specimen lack setae and setal sockets as in *traubi.* The abdominal chaetotaxy is also that of *traubi,* as is the shape of abdominal sternum 2, although the posterior emargination is more evenly arcuate than in most specimens of *traubi.* This probably is in the specimen which Maa meant to designate as the lectoholotype.

The other female has deteriorated badly. Setal sockets are visible on the middle wing veins, and sternum 2 is very deeply emarginate, as in *N. dubia* Rudow. Despite the shriveled condition of the abdomen, the longitudinal bands of long dorsal connexival setae characteristic of *dubia* are evident. Although Speiser's figure (loc. cit.) of *megastigma* does not show setae on the middle wing vein, probably because they were broken off, it does illustrate the longitudinal bands of setae. The male specimen, too, is clearly *dubia.* Thus, Speiser's original series contained both *traubi* and *dubia,* probably from different localities.

Maa's designation of a lectoholotype has not been published. I have added a label to the vial designating the female of *dubia* as the lectoholotype of *Lepopteryx megastigma* Speiser, which thereby becomes a synonym of *Lipoptena dubia* Rudow.

At hand are two females (AMNH, mounted on slides) from Brazil (Amazonas, Cacão Perei-

ra Igarapi, near Manaos), that resemble *dubia* in possessing two or three setae on the median wing vein, and in having a longitudinal band of coarse, longer setae along each side of dorsal abdominal connexivum. Sternum 2 is emarginate as in *traubi*, but shorter. The seventh tergites and sternites and the supra-anal plate are more heavily sclerotized than in either of these species and their setae coarser. The supra-anal plate has two shorter discal setae in addition to the pair of strong lateral setae and the distal macrosetae. These specimens appear to represent an undescribed species. Unfortunately, both are in very poor condition. Description of this interesting species should be deferred until more suitable material including males is available.

Venezuelan Survey Records (6 males, 3 females ex 3 *Noctilio leporinus*)

T. F. AMAZONAS: 1 male, 84 km SSE Esmeralda, 10 km up Río Mavaca, Boca Mavaca, 138 m, 20-III-67; 5 males and 2 females, 84 km SSE Esmeralda, 7 km up Río Mavaca, Boca Mavaca, 138 m, 2-III-67; 1 female, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-IV-67.

Other Venezuelan Material Examined

BRAZIL: 17 males and 14 females ex 8 *Noctilio leporinus*, Para, Río Tapajoz, Ilha de Urucurituba, 22-VI-61, A. M. Olalla (taken in association with *Noctiliostrebla aitkeni* from 5 of the 8 bats). I have also seen other specimens from Brazil (BMNH), without further locality, and from the Río Madeira [sic!] of Brazil (AMNH).

Noctiliostrebla traubi Wenzel
(Fig. 45A, C; 46C, D)

Noctiliostrebla traubi Wenzel, 1966:565, Fig. 106, 107B, D

Venezuelan Survey Records (101 males, 110 females)

CARABOBO: 1 male ex 1 *Noctilio labialis*, 4 males and 5 females ex *Noctilio leporinus*, 10 km NW Urama, El Central, Urama, 25 m, 17-23-III-66.

GUÁRICO: 1 female ex *Noctilio leporinus*, 35 km SSW San Juan de los Morros, Hto. Las Palmitas, 181 m, 7-I-68.

YARACUY: 52 males and 63 females ex *Noctilio leporinus*, 10 km NW Urama, El Central, Urama, 25 m, 8-14-III-66; 1 female, same host, 11 km NW Urama, El Central, Urama, 25 m, 14-III-66.

ZULIA: 40 males and 37 females ex *Noctilio leporinus*, 42 km WNW Encontrados, El Rosario, 24 m, 24-II—3-IV-68; 4 males and 3 females, same host, 33 km NW La Paz, nr. Cerro Azul, 75 m, 15-VI-68.

Host Associations

Of 211 specimens of *Noctiliostrebla traubi* collected by the survey teams, 210 (99.5 percent) were from *Noctilio leporinus*.

Remarks

Noctiliostrebla traubi is known to be from the Greater Antilles, Central America, the coastal lowlands of Peru and Colombia, and northwestern Venezuela.

Noctiliostrebla maai Wenzel
(Fig. 45B, D; 46A, B)

Noctiliostrebla maai Wenzel, 1966:569, Fig. 107A, 109

Venezuelan Survey Records (103 males, 116 females)

APURE: 1 female ex 1 *Molossus ater*, 9 males and 17 females ex *Noctilio labialis*, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 14-28-XII-65; 14 males and 10 females, same host, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 6-28-XII-65; 3 males and 1 female, same host, Pto. Páez, 76 m, 17-I-66.

CARABOBO: 7 males and 3 females ex *Noctilio labialis*, 10 km NW Urama, El Central, Urama, 25 m, 17-III-66.

FALCÓN: 10 males and 5 females ex *Noctilio labialis*, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 27-IX—4-X-65.

MIRANDA: 2 males and 2 females ex *Noctilio labialis*. 4 km E Río Chico, nr. Pto. Tuy, 1 m, 10-XI-66; 1 male and 2 females, same host, 5 km E Río Chico, nr. Pto. Tuy, 1 m, 17-XI-66; 1 male and 1 female, same host, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 17-XI-66.

MONAGAS: 4 males and 5 females ex *Noctilio labialis*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 4-VI-68.

SUCRE: 1 female ex *Noctilio leporinus*, 9 km NE Güiria, Ensenada Cauranta, 1 m, 3-VI-67.

T. F. AMAZONAS: 1 female ex *Noctilio labialis*, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 24-IX-67; 4 males and 6 females, same host, 28 km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-X-67; 6 males and 10 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 14-24-VII-67.

YARACUY: 5 males and 7 females ex *Noctilio labialis*, 11 km NW Urama, El Central, Urama, 25 m, 14-15-III-66; 34 males and 42 fe-

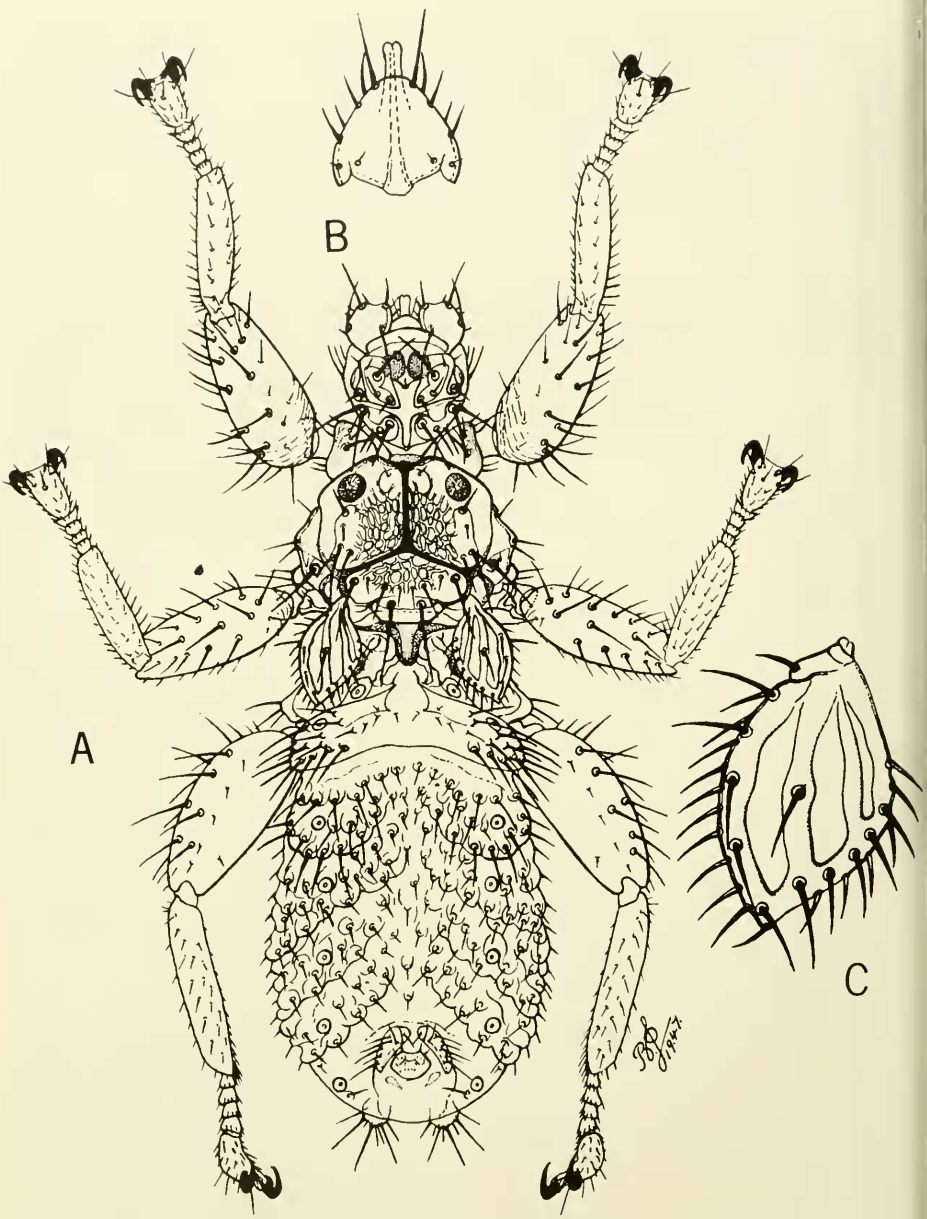

Fig. 46. A-B, *Noctiliostrebla maai* Wenzel: A, male genitalia; B, female supra-anal plate. C-D, *Noctiliostrebla traubi* Wenzel: C, male genitalia; D, female supra-anal plate. From Wenzel et al. (1966).

males, same host, 10 km NW Urama, El Central, Urama, 25 m, 8-14-III-66.

ZULIA: 2 males and 2 females ex *Noctilio labialis*, 42 km WNW Encontrados, El Rosario, 24 m, 5-III-68.

Other Venezuelan Material Examined

BOLÍVAR: 2 males ex *Noctilio labialis* (Machado-Allison No. 598), Playa del Medio, 19-IV-61, J. Ojasti.

Host Associations

Of 219 specimens of *Noctiliostrebla maai* collected by the survey teams, 217 (99 percent) were from 86 *Noctilio labialis*. The single specimen from *Molossus ater* is probably a stray or a transitory parasite, and the single record from *Noctilio leporinus* is so unusual that one suspects a misidentification of the host.

Noctiliostrebla aitkeni Wenzel
(Fig. 44)

Noctiliostrebla aitkeni Wenzel, 1966:567, Fig. 107C, 108

Aspidoptera megastigma Speiser of Jobling (part), 1949a:140, Fig. 3A-C

Venezuelan Survey Records (58 males, 59 females, 1 sex undet.)

BOLÍVAR: 12 males and 16 females ex *Noctilio leporinus*, 50 km SE El Manteco, Río Supamo, 150 m, 8-11-IV-66.

MIRANDA: 2 males ex *Noctilio leporinus*, 5 km E Río Chico, nr. Pto. Tuy, 1 m, 21-XI-66; 11 males, 16 females, and 1 sex undet., same host, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 5-9-XI-66.

MONAGAS: 1 male and 1 female ex *Noctilio leporinus*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68.

SUCRE: 3 males and 2 females ex *Noctilio leporinus*, 9 km NE Güiria, Ensenada Cauranta, 1 m, 3-VI-67.

T. F. AMAZONAS: 1 male ex 1 *Saccopteryx bilineata*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 12-I-67; 3 males and 2 females ex *Noctilio leporinus*, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 12-I—2-II-67; 10 males and 5 females, same host, 84 km SSE Esmeralda, 19 km up Río Mavaca, Boca Mavaca, 138 m, 20-III-67; 4 males and 5 females, same host, 84 km SSE Esmeralda, 7 km up Río Mavaca, Boca Mavaca, 138 m, 1-III-67; 8 males and 7 females, same host, 84 km SSE Esmeralda, 9 km up Río Mavaca, Boca Mavaca, 138 m, 10-III-67; 3 males and 5 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-IV-67.

YARACUY: 1 male ex *Noctilio leporinus*, 11 km NW Urama, El Central, Urama, 25 m, 14-15-III-66.

Host Associations

Of 118 specimens of *Noctiliostrebla aitkeni* collected by the survey teams, 117 (99 percent) were from 19 *Noctilio leporinus*. The single specimen from *Saccopteryx bilineata* is probably a contaminant or transitory association.

Genus *Paradyschiria* Speiser

Paradyschiria Speiser, 1900:55

Type Species: *Paradyschiria fusca* Speiser, 1900:56

The flies of this genus, too, are parasites on noctilionid bats. It should be noted that the males possess two very small, oval, transverse sternites that appear to be remnants of the fifth sternum.

Key to the Known Species of *Paradyschiria*

Males

1. Mesonotum lacking a short seta lateral to and usually anterior to the posterior macroseta. Setae of dorsal connexivum of about same length as those along middle of apical margin of sternum 2. Ventral margins of postgonites nearly straight, apices not hooked (Fig. 49A) 2

   Mesonotum usually with a short seta lateral to the posterior macroseta. Setae of dorsal connexivum distinctly shorter than median setae on posterior margin of sternum 2. Postgonites strongly curved, sickle shaped (Fig. 49C) or, if not, the apices are slightly but distinctly hooked (Fig. 49B) 3

2. Posterior margin of each lateral lobe of tergum usually with 1 (rarely 2) macrosetae that are conspicuously longer than the others ..... *lineata* Kessel

   Posterior margin of each lateral lobe of tergum 1+2 usually with 2 or 3 long, subequal macrosetae that are conspicuously longer than the others ..... *fusca* Speiser

3. Postgonites strongly bent, sickle shaped (Fig. 49C) ..... *curvatas* n. sp.

   Postgonites not thus 4

4. Postgonites rather abruptly tapered on distal half (Fig. 49B) ..... *parvuloides* Wenzel
Postgonites rather evenly tapered to apex, ventral margins nearly straight, much as in *lineata* (Fig. 49A), but apices distinctly hooked. ..... *parvula* Falcoz

FEMALES

1. Mesonotum lacking a short seta anterior and lateral to the long macroseta of posterolateral angle. Lateral abdominal connexivum on each side with an elongate-oval, vertical sclerite between posterior margin of lateral lobe of tergum 1+2 and spiracle 3. Supra-anal plate (Fig. 48B) with a macroseta in each basolateral angle 2
Mesonotum (Fig. 47A) usually with a short seta on each side anterior and lateral to the long posterior macroseta. Lateral connexivum without a vertical sclerite. Supra-anal plate (Fig. 48D) lacking a macroseta in basolateral angles 3

2. Posterior margin of tergum 1+2 usually with 1 (rarely 2) macrosetae that are conspicuously longer than the others. Middorsal setae of abdominal connexivum conspicuously shorter than those lateral to them, those near base and apex shortest, the apical ones less than half as long as the setae lateral to them. Supra-anal plate (Fig. 48B) usually with the basolateral macrosetae more widely separated than the outer setae of apical margin ..... *lineata* Kessel
Posterior margin of tergum 1+2 usually with 2 or 3 long, subequal macrosetae that are conspicuously longer than the others. Most of middorsal setae of abdominal connexivum shorter than those lateral to them, but not markedly so, many of them more than half as long as the setae lateral to them. Basolateral macrosetae of supra-anal plate usually no more widely separated than outer macrosetae of apical margin ..... *fusca* Speiser

3. Seventh sternites elongate, longer than broad, without any short, stouter, spinelike setae along distal margin ..... *parvula* Falcoz
Seventh sternites suborbicular or transversely oval with 1-4 short, spinelike setae along distal margin (Fig. 48C) 4

4. Supra-anal plate distinctly longer than broad, sides subparallel, the anterior margin broadly rounded. Seventh sternites each with 1-2 heavier, short, spinelike setae on apical margin, the other setae normal. Ventral arc of terminal cone with a broad anteriorly directed extension which projects forward internally and recurves ventrally and then posteriorly to terminate near the distal flanges of the seventh sternites; this scooplike structure easily visible through the integument of cleared specimens ..... *curvata* n. sp.
Supra-anal plate slightly wider than, or as wide as long, the basal (anterior) margin roundly angulate. Seventh sternites (Fig. 48C) each with 3-4, rarely 2, spinelike setae on distal margin. Ventral arc of terminal cone with only a relatively short, ventrally directed, lobelike extension ..... *parvuloides* Wenzel

Paradyschiria parvula Falcoz

Paradyschiria parvula Falcoz, 1931:267.—Wenzel, Tipton, and Kiewlicz, 1966:574
Paradyschiria dubia, authors (part), not Rudow

VENEZUELAN SURVEY RECORDS (430 males, 392 females, 1 sex undet.)

APURE: 1 male ex *Noctilio labialis*, Pto. Páez, 76 m, 17-I-66.

CARABOBO: 27 males and 25 females ex *Noctilio labialis*, 10 km NW Urama, El Central, Urama, 25 m, 17-III-66.

FALCÓN: 25 males and 29 females ex *Noctilio labialis*, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 23-IX—4-X-65; 13 males and 8 females, same host, 19 km NW Urama, Km 40, Urama, 25 m, 29-X—12-XI-65.

MIRANDA: 4 males and 2 females ex *Noctilio labialis*, 4 km E Río Chico, nr. Pto. Tuy, 1 m, 10-XI-66; 11 males and 9 females, same host, 5 km E Río Chico, nr. Pto. Tuy, 1 m, 17-XI-66; 11 males and 11 females, same host, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 5-17-XI-66.

MONAGAS: 6 males and 8 females ex *Noctilio labialis*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 4-VI-68.

T. F. AMAZONAS: 1 female ex 1 *Molossus aztecus*, 2 males and 1 female ex 3 *Molossus ater*, 156 males, 142 females, and 1 sex undet. ex *Noctilio labialis*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 14-24-VII-67; 47 males and 45 females, same host, 28 km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-X-67; 1 male, same host, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 24-IX-67.

YARACUY: 104 males and 81 females ex *Noctilio labialis*, 10 km NW Urama, El Central, Urama, 25 m, 8-14-III-66; 32 males and 30 females, same host, 11 km NW Urama, El Central, Urama, 25 m, 15-III-66.

Host Associations

Of 823 specimens collected by the survey teams, 819 (99.5 percent) were from 113 *Noctilio labialis*. The records from *Molossus aztecus* and *M. ater* could represent contaminants or transitory transfers. The host specimens of both species of *Molossus* as well as specimens of *N. labialis* were collected "near stream in tree" (probably the same tree) on the same date.

Paradyschiria parvuloides Wenzel

(Fig. 47A, 48C, D; 49B)

Paradyschiria parvuloides Wenzel, 1966:575, Fig. 110D, 112C-D, 113B, 114A-B

Venezuelan Survey Records (25 males, 18 females ex 6 *Noctilio labialis*)

APURE: 1 male, Pto. Páez, 76 m, 17-I-66.

TRUJILLO: 13 males and 8 females, 47 km WNW Valera, La Ceiba, 29 m, 19-II-66.

ZULIA: 11 males and 10 females, 42 km WNW Encontrados, El Rosario, 24 m, 5-III-68.

Paradyschiria curvata, new species

(Fig. 49C)

This species is most similar to *Paradyschiria parvula* Falcoz and *P. parvuloides* Wenzel. The females resemble those of *parvuloides* in the shape and chaetotaxy of the seventh sternites (see key above) but in *curvata* these possess only one (rarely two) spinelike setae on distal margin. The supra-anal plate is much longer than in any other species. This elongation may be correlated with the remarkable internal scooplike extension of the ventral arc (see description and key), which is unique among these species. In females of the other *Paradyschiria*, the ventral arc does have a ventrally directed, posteriorly concave, lobelike flange whose length varies according to the species, but this does not project anteriorly and then descend to recurve posteriorly as a scooplike structure. The strongly curved postgonites of the male are unique among the known species of the genus.

Description

Generally resembles the characters of *parvula* and *parvuloides* and, like them, usually has a short seta lateral and slightly anterior to the posterior mesonotal macroseta. Posterior margins of lateral lobes of tergum 1+2 in both sexes generally with 2 macrosetae that are distinctly longer than the others, but all less pronounced in the male. Distinctive characters as follows: Male: Postgonites strongly bent, sickleshaped. Apex of aedeagus hastate. Female: Supra-anal plate markedly longer than broad, the sides subparallel, anterior margin broadly rounded; chaetotaxy as in *parvula* and *parvuloides*, i.e., with 4 distal macrosetae, a short subapical seta on lateral margin and a pair of short, widely separated discal setae near apex. Seventh sternites roughly oval, transverse, with well-developed distal flanges; each usually with about 6 setae on outer and distal margins, including a macroseta near lateral margin, the other 5 much shorter, 1 or 2 of those near inner margin spinelike; a pair of macrosetae present behind these; posterior half of sternite with 8-10 shorter setae of varying lengths. Ventral arc with a broad lobe which extends anteriorly and then descends and recurves posteriorly, its posterior face concave, the whole structure resembling a curved scoop.

Measurements

	Males	Females
BL	1.48-1.72	1.45-1.91
TL	0.36-0.37	0.33-0.40

Type Data: Male holotype and female allotype ex *Noctilio labialis* (SVP 5689), Venezuela, Apure, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 15-XII-65. Paratypes—Apure: 118 males and 95 females, same data as holotype but 14-28-XII-65; 6 females ex *Noctilio labialis*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 24-XII-65; 7 males and 4 females, same host, Pto. Páez, 76 m, 17-I-66. Bolívar: 1 male ex *Noctilio labialis*, 47 km ESE Caicara, Hato La Florida, 50 m, 50-V-67.

Other Venezuelan Material Examined

APURE: 1 male ex 1 *Trachops cirrhosus*, 32 km NE Pto. Paez, La Villa, Hato Cariben, 76 m, 24-XII-65; 1 male and 1 female ex *Molossus ater*, Pto. Páez, 76 m, 17-I-66; 1 female ex 1 *Desmodus rotundus*, 1 male ex *Molossus ater*, 2 sex undet.

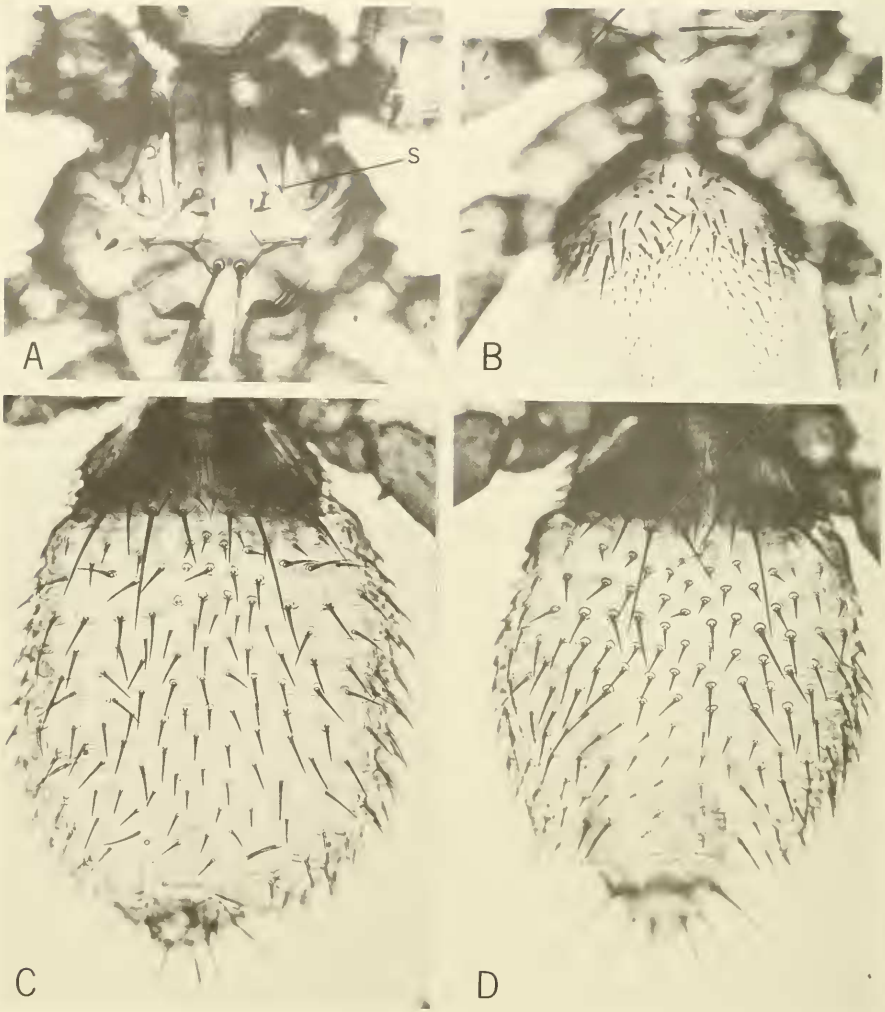

Fig. 47. A-B, *Paradyschiria parvuloides* Wenzel, male: A, thorax, dorsal view (*s* = seta anterolateral to posterior mesonotal macrosetae); B, base of abdomen and thorax. C, *Paradyschiria fusca* (Speiser) (Trinidad), and D, *Paradyschiria lineata* (Kessel) (Panama): dorsal view, female abdomen. From Wenzel et al. (1966).

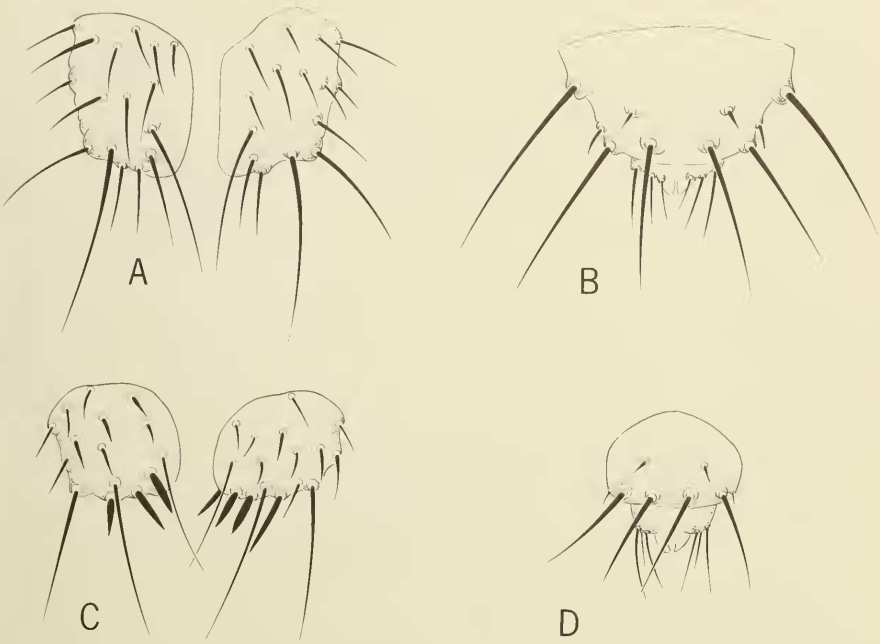

Fig. 48. A-B, *Paradyschiria lincata* Kessel, female: A. seventh sternites; B, supra-anal plate. C-D, *Paradyschiria parvuloides* Wenzel, female: C, seventh sternites; D, supra-anal plate. From Wenzel et al. (1966).

ex *Noctilio labialis*, same data as the holotype but 14-28-XII-65.

Remarks

This unusual species, which appears to be restricted to *Noctilio labialis*, is known to me only from Venezuelan collections. Its limited distribution in relation to the other species of the genus that occur on *N. labialis* is interesting.

Paradyschiria fusca Speiser
(Fig. 47C)

Paradyschiria fusca Speiser, 1900:56, Pl. 3, Fig. 1.—Wenzel, Tipton, and Kiewlicz, 1966:573, Fig. 110C, 111B.

Paradyschiria dubia Rudow of Guimarães, 1941: 217, Fig. 1-4, misident.

Venezuelan Survey Records (84 males, 111 females ex 17 *Noctilio leporinus*)

BOLÍVAR: 1 male, 47 km ESE Caicara, Hato La Florida, 50 m, 4-V-67; 35 males and 47 females, 50 km SE El Manteco, Río Supamo, 150 m, 8-10-IV-66.

MIRANDA: 2 males and 5 females, 1 km S Río Chico, 1 m, 5-XI-66; 1 male and 2 females, 5 km E Río Chico, nr. Pto. Tuy, 1 m, 21-XI-66; 7 males and 9 females, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 5-XI-66.

MONAGAS: 2 males and 16 females, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68.

T. F. AMAZONAS: 31 males and 21 females, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 12-I—2-II-67; 4 males and 6 females, 84 km SSE Esmeralda, 10 km up Río Mavaca, Boca Mavaca, 138 m, 20-III-67; 2 females, 84 km SSE Esmeralda, 7 km up Río Mavaca, Boca Mavaca, 138 m, 2-III-67; 1 male and 2 females, 84 km SSE Esmeralda, 9 km up Río Mavaca, Boca Mavaca, 138 m, 10-III-67; 1 female, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-IV-67.

Other Venezuelan Material Examined

MIRANDA: 1 female ex *Noctilio labialis*, km 125, Caracas-Higuerate Rd., 30-VIII-62, T. Cobo.

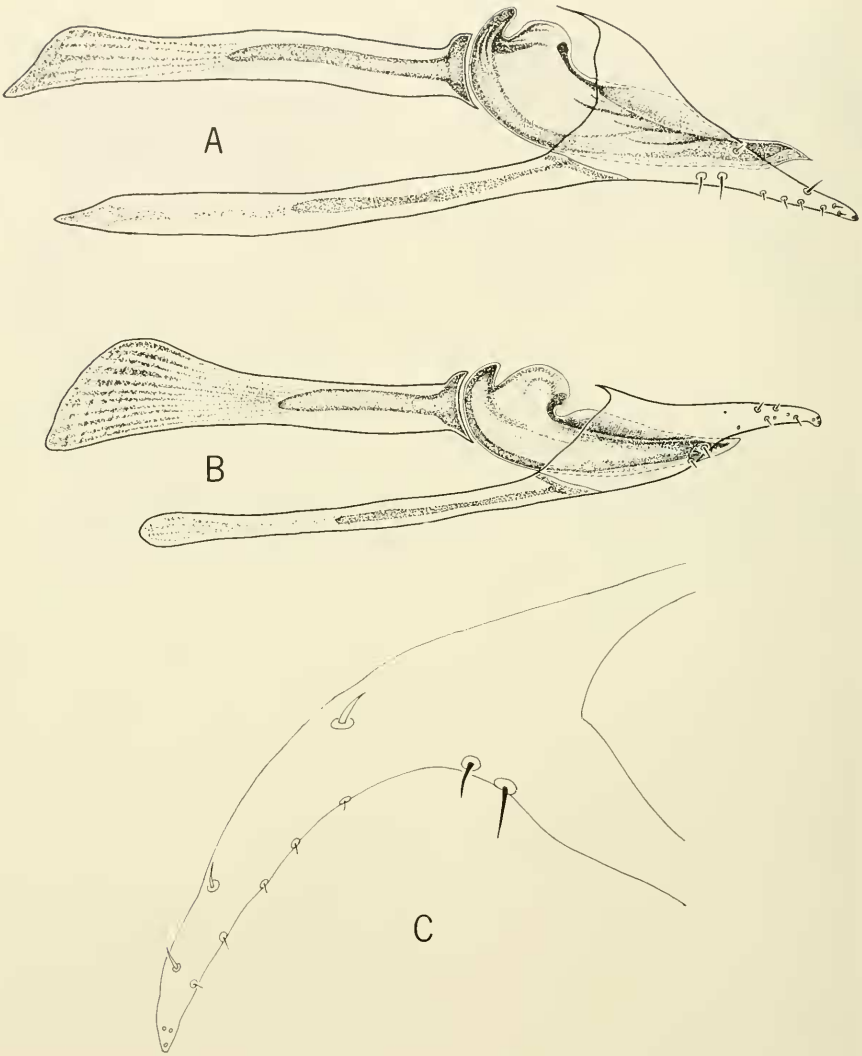

Fig. 49. A-B, male aedeagus and postgonites: A, *Paradyschiria lineata* Kessel; B, *Paradyschiria parvuloides* Wenzel. C, *Paradyschiria curvata*, new species (SVP 5684): right male postgonites. A-B from Wenzel et al. (1966).

Host Associations

All of the survey collections and all other reliable records that I know of for this species are from *Noctilio leporinus*. The single specimen from *N. labialis* may be a contaminant.

Paradyschiria lineata Kessel
(Fig. 47D, 48A-B, 49A)

Paradyschiria lineata Kessel, 1925:27.—Wenzel, Tipton, and Kiewliez, 1966:574, Fig. 110A-B, 111A.

Venezuelan Survey Records (174 males, 157 females)

CARABOBO: 13 males and 9 females ex *Noctilio leporinus*, 10 km NW Urama, El Central, Urama, 25 m, 23-III-66.

GUÁRICO: 4 males and 3 females ex *Noctilio leporinus*, 35 km SSW San Juan de los Morros, Hto. Las Palmitas, 181 m, 4-IX-66.

YARACUY: 1 male ex 1 *Noctilio labialis*, 128 males and 118 females ex *Noctilio leporinus*, 10 km NW Urama, El Central, Urama, 25 m, 8-14-III-66; 1 male and 3 females, same host, 1 male ex 1 *Pteronotus parnellii*, 11 km NW Urama, El Central, Urama, 25 m, 14-III-66.

ZULIA: 20 males and 18 females ex *Noctilio leporinus*, 42 km WNW Encontrados, El Rosario, 24 m, 24-II—3-IV-68; 6 males and 6 females, same host, 33 km NW La Paz, nr. Cerro Azul, 75 m, 15-VI-68.

Host Associations

Of 231 specimens of *Paradyschiria lineata* that were collected by the survey teams, 229 (99 percent) were collected from 37 *Noctilio leporinus*. The single specimen reported from two other hosts probably represent contamination or misassociation.

Remarks

Paradyschiria lineata is very similar to *P. fusca*. Its easternmost distribution is contiguous with that of *fusca*, and it may be that the two are geographic "races" of a single species.

Genus *Speiseria* Kessel

Speiseria Kessel, 1925:19

Type Species: *Speiseria ambigua* Kessel, 1925:20

This previously monotypic genus proves to be a group of at least four or more species. Study of the Venezuelan collections disclosed the existence there of three very similar species of *Speiseria*: *S. ambigua*, a characteristic parasite on *Carollia perspicillata; S. peytoni* n. sp. on *C. subrufa;* and *S. magnioculus* n. sp. on *Trachops cirrhosus*. In the collection of Field Museum there is a fourth (undescribed) species taken from *Natalus stramineus mexicanus* in Guatemala. Further, two males which Wenzel et al. (1966:550) recorded from Panama as *S. ambigua* from *Glossophaga soricina leachii* may also be distinct. These have very small eyes with only six facets, the central ommatidia being absent. The postgonites of these are very similar to those of specimens taken in Panama from *C. brevicauda* (see remarks under *S. peytoni*).

The species of *Speiseria* are remarkably similar in appearance to two new species of the *Trichobius phyllostomae* group (q.v.) *T. petersoni* n. sp. and *T. hispidus* n. sp. The head of these two species of *Trichobius* is also remarkably similar to that of *Speiseria* in the shape of the occipital plates and the long erect macrosetae inserted on tubercles. The strong anterior projection of the mesosternum and the greatly elongated hindlegs enhance the resemblance, so much so that I briefly considered placing *Speiseria* as a synonym of *Trichobius* and assigning the species to the *T. phyllostomae* group. However, a careful analysis of these taxa reveals many differences. These are listed in Table 1.

A number of the characters by which the species of *Speiseria* differ from the two new species of the *T. phyllostomae* group are shared with *Pseudostrebla ribeiroi* Lima and some other species of *Pseudostrebla*. In Table 1, these characters are preceded by an asterisk. Some of these are also shared by *Parastrebla* and *Stizostrebla*.

Except for its somewhat broader and flatter head, its shorter hindlegs, and very long metatibial macrosetae, *P. ribeiroi* proves to be remarkably similar to species of *Speiseria*, with only minor exceptions. In *Pseudostrebla* (and *Stizostrebla*) the occipital lobes appear to be contiguous at midline (they nearly meet in *Speiseria*), each laterovertex is divided by an oblique basolateral, dark line, and the palpi are even more strongly transverse than in *S. magnioculus*. These differences may well be correlated with the broadening and flattening of the head. The dorsum of the head of *Speiseria* species is most like that of *Parastrebla handleyi*, in which the occipital lobes are separated.

It appears that the extraordinary similarity between species of *Speiseria* and *T. petersoni* and *hispidus* is a remarkable convergence, and that *Speiseria* is probably best placed near *Pseudostrebla* and *Parastrebla*.

In all females of *Speiseria*, the ventral connexivum has at least one, and sometimes a second, less well-defined row of longer, conspicuously stronger, curved setae anterior to the seventh sternites. The location and appearance of these setae suggest that they are homologous with the curved blunt setae found in females of *Parastrebla*.

Key to Species of *Speiseria*

1. Eyes usually with 11-12 (rarely 9) facets, usually widest (deepest) anteriorly, viewed from the sides; palpi nearly transverse; theca with ± 24 setae. Setae on posterior margin of sternum 2 subequal in length and coarseness, those toward the sides not coarser or shorter. FEMALE. Tergum 7 widest at base, distinctly constricted near midlength. MALE. Sternum 7+8 with 13-14, tergum 9 with 11-12 setae. .... *magnioculus* n. sp.

   Eyes usually with 9 facets, widest (deepest) at midlength. Palpi elongate-oval, oblique, not transverse; theca with ± 18 setae. Setae along median portion of posterior margin of sternum 2 distinctly finer and longer than those toward sides. FEMALE. Tergum 7 widest distally or parallel-sided, not constricted at midlength. MALE. Sternum 7+8 with 4-6, tergum 9 with 9-10 setae. 2

2. FEMALE. Tergum 7 elongate, usually with subparallel sides and distinctly longer than supra-anal plate and cerci combined. MALE. Apices of postgonites strongly curved (Fig. 50C) ..... *ambigua* Kessel

   FEMALE. Tergum 7 usually more oval, sides distinctly converging anteriorly, not longer than supra-anal plate and cerci combined. MALE. Postgonites nearly straight, apices feebly curved (Fig. 52B) ..... *peytoni* n. sp.

Table 1. Differences between species of *Speiseria* and *Trichobius petersoni* n. sp. and *T. hispidus* n. sp. (*T. phyllostomae* group)

Species of *Speiseria*	*Trichobius petersoni* and *hispidus* n. sp. (*T. phyllostomae* group)
Eyes with 9-12 facets.	Eyes with 25-36 facets.
°Palpi transverse (in *magnioculus* only).	Palpi nearly transverse (in *T. petersoni* only)
°Underside of head funnel-shaped, compressed behind the oral cavity, the compressed portion terminating in a knob-like lobe; median postoral area bare and bounded by macrosetae in two longitudinal rows.	Underside of head not strongly compressed, the area behind the oral cavity rounded, with two or more transverse rows of short setae.
°Anterior margin of thorax rather conspicuously excavated on each side for the reception of the occipital lobes.	Anterior margin of thorax sinuate, at most feebly excavated for reception of occipital lobes.
°Intercoxal mesosternal projection longer, sides of mesosternum rather obtusely margined from the posterior margin of mesocoxa nearly to metacoxa.	Intercoxal projection shorter, sides of mesosternum posterior to procoxae, not noticeably margined.
°Metasternal lobe absent.	Metasternal lobe long, pointed, dorsally reflexed, extending about halfway to metepimeron.

*Sixth longitudinal wing vein with macrosetae at basal angle.	Sixth longitudinal wing vein lacking setae at or near basal angle.
*Pro- and mesotibiae with macrosetae. Dorsal edge of metatibiae with a few scattered erect or semierect distinctly longer setae. Last tarsal segment of hindlegs strongly laterally compressed, scarcely wider than the other segments.	Pro- and mesotibiae lacking macrosetae. Metatibiae with uniformly short setae. Last segment of hind tarsi not laterally compressed, about twice as broad as other segments.
*Female. Tergum 7 elongate, at least twice as long as wide, conspicuously narrower than supra-anal plate, typically with two pairs of distal setae, the anterior pair longest.	Female. Tergum 7 very short, transverse, nearly as wide as supra-anal plate, with a long macroseta near outer edge on each side, and a pair of shorter setae medial to these.
*Cerci free.	Cerci fused with ventral arc.
*A pregenital sclerite present.	Pregenital sclerite lacking.
*A postgenital sclerite absent.[8]	Postgenital sclerite present.
*Male. Postgonites symmetrical both in shape and insertion of ventral setae; accessory setae inserted anterior to macrosetae.	Male. Postgonites asymmetrical both in shape and in insertion of ventral setae; accessory setae inserted posterior to macrosetae.

*Characters shared by species of *Speiseria* and species of *Pseudostrebla* (especially *P. ribeiroi*)

Speiseria ambigua Kessel
(Fig. 50)

Speiseria ambigua Kessel, 1925:20, Pl. 1, Fig. 1-2.—Wenzel, Tipton, and Kiewlicz, 1966: 549, Fig. 102A-C

Synthesiostrebla amorphochili, Jobling, 1939a: 488, Fig. 1A-C, not Townsend

Paratrichobius anduzei Matheson, 1945:191, Fig. 1A-E

The discovery of several new species of *Speiseria*, all extraordinary similar to *S. ambigua* Kessel, raises a question as to the identity of *ambigua*. Unfortunately, I have not had an opportunity to examine Kessel's type, from "*Vampyrus*" from Pernambuco, Brazil. While it could prove to be the same as one of the new species described below, it is most likely the characteristic parasite of *Carollia perspicillata*. *Carollia brevicauda*, the host of *S. peytoni* n. sp., apparently does not occur in the northeast or south of Brazil (Pine, 1972). Thus, *ambigua* is not apt to be identical with *peytoni*.

It seems unlikely that it is the same as *S. magnioculus*, either, because that species appears to be uncommon even on its characteristic host, *Trachops cirrhosus*. Of the 362 specimens of this bat collected on the survey, only about 10 percent were parasitized by this fly.

Through the courtesy of Dr. L. L. Pechuman, I have been able to reexamine the female type and the two male paratypes of *Paratrichobius anduzei* Matheson, from "San Esteban," Venezuela. The eyes, male postgonites, and other characters are clearly those of *S. ambigua*, as interpreted by me.

Venezuelan Survey Records (188 males, 98 females, 2 sex undet.)

Speiseria ambigua is such a characteristic parasite of the extraordinarily ubiquitous host, *Carollia perspicillata*, that there is little point in giving detailed distribution records. To briefly summarize, the survey teams collected this fly at 59 localities in 13 states, as follows: Apure (1 locality, 24 m); Barinas (2 localities, 619-794 m); Bolívar (8 localities, 150-916 m); Carabobo (5 localities, 25-1,537 m); Falcón (5 localities, 2-250 m); Guárico (2 localities, 470-630 m); Miranda (5 localities, 1-1,160 m); Monagas (3

[8]Wenzel et al. (1966:549) erred in stating that (1) a postgenital sclerite was present in females of *Speiseria* and that (2) the cerci were fused to the ventral arc. The subgenital sclerite that is present is anterior, not posterior, to the vulva. The female cerci are free.

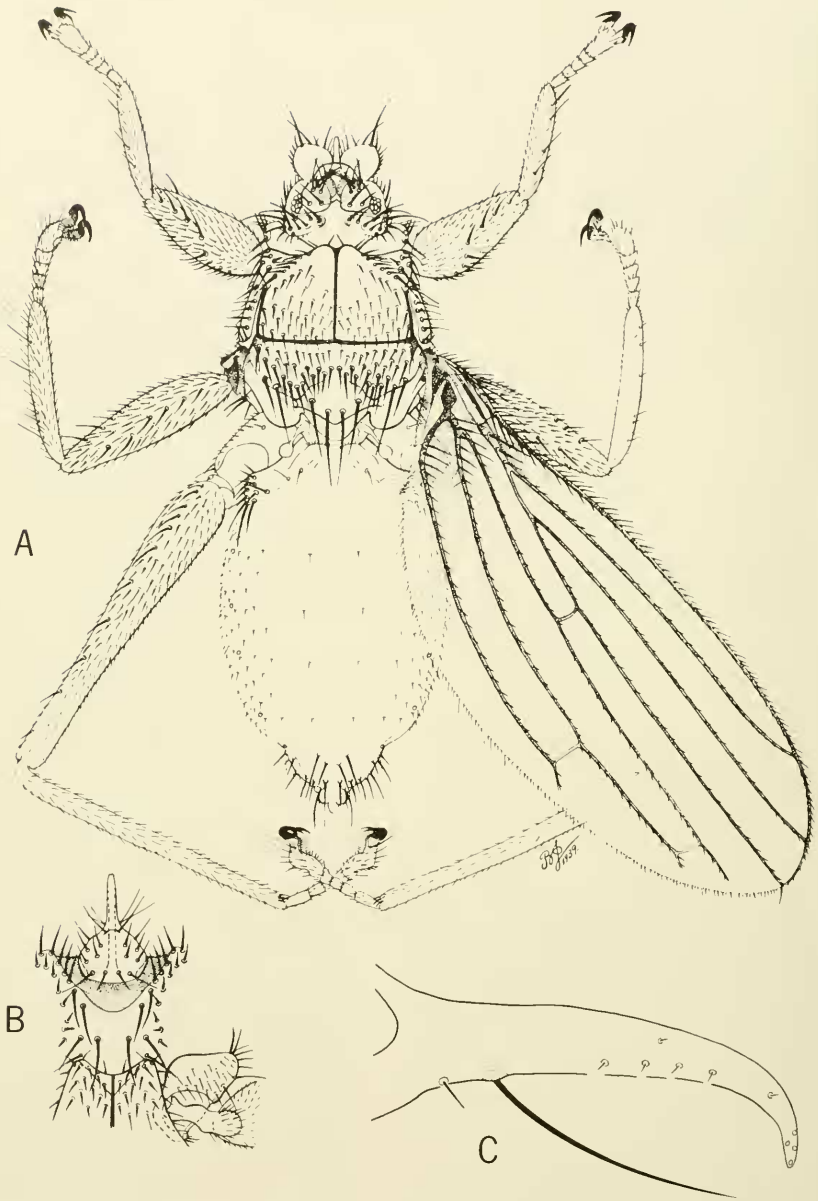

Fig. 50. *Speiseria ambigua* Kessel: A, female, dorsal view: B, posterior margin of head and anterior portion of mesosternum: C, left male postgonites. A-B from Jobling (1939); C from Wenzel et al. (1966).

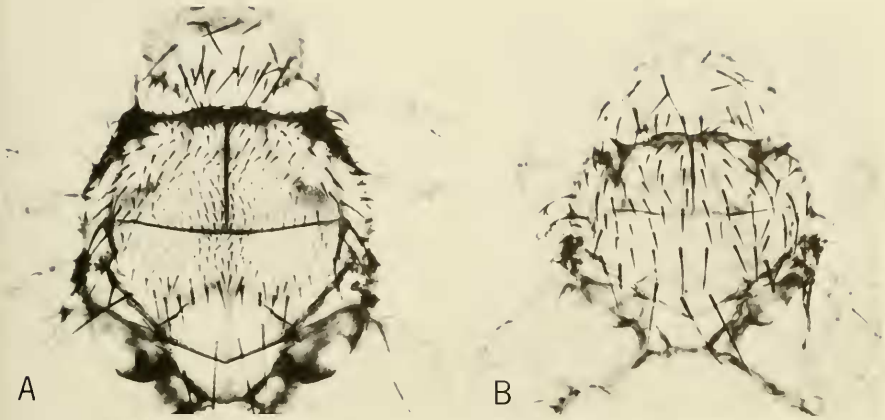

Fig. 51. A, *Parastrebla handleyi*: dorsal view of thorax, male (SVP 7573). B, *Pseudostrebla sparsisetis*, new species: dorsal view of thorax, male (FMNH 88081).

localities, 854-1,170 m); Sucre (5 localities, 2-380 m); T. F. Amazonas (9 localities, 114-161 m); Trujillo (3 localities, 90-164 m); Yaracuy (2 localities, 25-37 m); Zulia (9 localities, 37-270 m).

Host Associations

Of 288 specimens of *Speiseria ambigua* collected by the survey teams, 277 (96 percent) were from 220 *Carollia perspicillata*. The remaining 11 were from 9 bats from 6 different species.

Speiseria peytoni, new species
(Fig. 52B)

Agreeing with *Speiseria ambigua* in virtually all of its characters, but usually lightly rather than darkly-stramineous in color, with slightly less elongate palpi, slightly shorter mesonotum, generally more slender setae, and seventh tergum generally more teardrop shaped (sometimes with subparallel sides). Easily identifiable only by the male postgonites which are nearly straight rather than strongly curved distally. The characters given in the key for separating females from *ambigua* vary greatly and cannot be relied upon for positive identification.

Description

General form, chaetotaxy, and structure as in *Speiseria ambigua*, but smaller, paler, and with generally weaker setae. *Head.* Eyes with 9 facets, oval, widest (deepest) at midlength, distinctly shorter than greatest width of a laterovertex. Palpi oval-ablique, not strongly transverse, ventral face and margins with ± 40 short setae in addition to the longer marginals. Theca with 8-10 setae on each side. *Abdomen.* Female. Tergum 7 about as long as supra-anal plate (with which it is united) and cerci combined, its sides feebly but distinctly converging anteriorly; with the usual pair of strong macrosetae, and distal to these a pair of shorter, strong setae near apex. Supra-anal plate, as usual in *Speiseria*, with 4 slender macrosetae, the median pair displaced anteriorly and lateral to these a single short seta near each side. Setae along apical margin of sternum 2 distinctly more slender and slightly longer along middle, becoming conspicuously stouter and slightly shorter laterad. Ventral abdominal connexivum just anterior to seventh sternites, with a row of ± 10 curved setae which are distinctly stronger and a little longer than those anterior to them. Seventh sternites with 16-17 setae. Male. Sternum 7+8 with a row of 4-5 setae, including a conspicuously longer macroseta dorsally and a shorter seta medial to it, the others usually becoming shorter lateroventrally; and distal to and removed from these is usually an additional seta of variable length. Tergum 9 with ± 10 setae consisting of an anterodorsal row of 3 macrosetae and a posterior row of 5 other setae of which the most dorsal ones are longer, the others short. Postgonites slender, nearly straight, feebly curved distally.

MEASUREMENTS

	Males	Females
BL	1.69-2.19	2.48-2.60
TL	0.71-0.78	0.79-0.86
WL	1.94-1.98	2.14-2.23
WW	0.82-0.88	0.90-0.96

TYPE DATA: Male holotype and female allotype ex *Carollia brevicauda* (SVP 33097), Venezuela, Carabobo, 4 km NW Montalbán, La Copa, 1,537 m, 29-XI-67. PARATYPES—APURE: 1 male ex *Carollia brevicauda*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 22-I-68. BARINAS: 5 males and 1 female ex *Carollia brevicauda*, 1 km SW Altamira, Altamira, 794 m, 13-14-XII-67; 18 males and 14 females, 2 km SW Altamira, Altamira, 609-794 m, 27-XII-67—4-I-68; 2 males, same host, 5 km SW Altamira, Altamira, 794 m, 13-XII-67; 2 males and 2 females, same host, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67; 12 males and 7 females, same host, Altamira, 794 m, 14-XII-67—9-I-68. BOLÍVAR: 1 male ex *Carollia brevicauda*, 85 km SSE El Dorado, Km 125, 1,032 m, 10-V-66. CARABOBO: 2 males ex *Carollia brevicauda*, 13.5 km NE Montalbán, La Voluntad, Montalbán, 1,007 m, 2-XI-67; 3 males and 2 females, same host, 3 km SW Montalbán, Hda. La Canada, Montalbán, 618 m, 22-XI-67; 1 male, same host, 3 km W Montalbán, Le Leonera, Montalbán, 900 m, 23-XI-67; 1 male and 3 females, same host, 9 km NE Montalbán, Cumbre Canoabo, Montalbán, 657-752 m, 1-XI-67; 7 males and 2 females, same locality data as the holotype but 26-29-XI-67. DTO. FEDERAL: 1 female ex *Carollia brevicauda*, 4 km NNW Caracas, Los Venados, 1,487 m, 15-VIII-65. MIRANDA: 3 males and 3 females ex *Carollia brevicauda*, 5 km NNW Guarenas, Curupao, 1,160 m, 5-11-X-66.

OTHER MATERIAL EXAMINED

COLOMBIA: Antioquia, 1 male, host undet. (Marinkelle 4899), Chigorado, 6-IV-66, C. J. Marinkelle; Putomayo, 1 male ex *Artibeus lituratus*, Pto. Asis, IX-65, C. J. Marinkelle.

HOST ASSOCIATIONS

All of the 95 specimens of *Speiseria peytoni* were from 74 *Carollia brevicauda*, and all but one were from bats collected above 600 meters elevation.

REMARKS

A collection from one specimen of *Carollia brevicauda* (SVP 32868) contained a male each of *Speiseria peytoni* n. sp. and *S. ambigua*. Specimens of *C. perspicillata* were collected at the same locality on the same data. Thus, the specimen of *S. ambigua* could be a contaminant.

Specimens which Wenzel et al. (1966:550) recorded as *S. ambigua* from Panamanian specimens of *C. "subrufa"* (*brevicauda*, fide Pine, 1972:36) and of *C. castanea* are very similar to *S. peytoni*, but the males have slightly more strongly curved postgonites.

This species is named for Patricia Peyton Johnson, secretary of the Department of Zoology at Field Museum, in grateful appreciation of her dedicated assistance in collating the large volume of data reported herein, in typing most of

Fig. 52. Male postgonites: A, *Speiseria magnioculus*, new species; B, *Speiseria peytoni*, new species (holotype); C, *Parastrebla handleyi* Wenzel (SVP 17454); D, *Pseudostrebla sparsisetis*, new species (SVP 88081).

the manuscript, and in assisting in many other ways over a period of several years.

Speiseria magnioculus, new species
(Fig. 52A)

Speiseria magnioculus differs from both *S. ambigua* Kessel and *S. peytoni* n. sp. in (1) its generally larger eyes, which have 11-12 (rarely 9) facets and are widest (deepest) anteriorly rather than at midlength (viewed from the side), and whose length is nearly equal to greatest width of a laterovertex, rather than distinctly shorter; (2) the nearly transverse palpi, which are densely setose below, having ± 60 short setae on ventral face and margins; (3) the large female tergum 7, which is widest posteriorly and distinctly constricted along midlength; (4) the more numerous setae (± 13-14) on male sternum 7+8 and on tergum 9 (11-12), as opposed to 4-5 on sternum 7+8 and 9-10 on tergum 9 in *ambigua* and *peytoni*. In general, *magnioculus* is a larger species with somewhat broader and more flattened head.

Description

A larger species with form, structure, and chaetotaxy generally as in *ambigua*, but distinctive as follows. *Head.* Somewhat broader and more flattened than in *ambigua;* palpi rather strongly transverse, their ventral face densely setose, with ± 60 short setae on face and margin in addition to the longer marginal setae; theca with ± 12 setae on each side (8-10 in *ambigua*). *Abdomen.* Setae along apical margin of sternum 2 slender, of nearly uniform thickness and length, those toward sides only very slightly coarser. Female. Tergum 7 large, distinctly longer than supra-anal plate and cerci combined, widest at base, distinctly constricted along midlength. Seventh sternites with ± 15 setae. Male. Sternum 7+8 with 13-14 setae, including 2-4 fairly long, thin setae dorsomedially and 2 macrosetae lateral to these, one of them conspicuously longer; ventral to these is a group of about 7 shorter setae and 2 other setae posterior to them. Tergum 9 with 11-12 setae, including 2-3 macrosetae, the others shorter, of varying lengths. Postgonites as in *ambigua*, their apices strongly curved.

Measurements

	Males	Females
BL	2.36-2.51	2.55-2.83
TL	0.83-0.90	0.92-0.96
WL	2.08-2.20	2.30-2.38
WW	0.95-1.04	1.03-1.07

Type Data: Male holotype and female allotype ex *Trachops cirrhosus* (SVP 17454), Venezuela, T. F. Amazonas, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-IV-67. Paratypes—VENEZUELA. Bolívar: 1 male and 1 female ex *Trachops cirrhosus*, 59 km SE El Dorado, km 74, El Manaco, 150 m, 14-VI-66; 1 male and 1 female, same host, 20 km W La Paragua, Hato San José, 306 m, 6-III—10-IV-67: T. F. Amazonas: 1 male ex *Trachops cirrhosus*, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 8-VIII-67; 10 males and 3 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-27-VII-67; 23 males and 15 females, same locality data as the holotype but 3-14-IV-67.

Host Associations

All of the 48 specimens of *Speiseria magnioculus* collected by the survey teams were taken from 34 *Trachops cirrhosus*. Interestingly, *S. magnioculus* does not appear to occur on that host in Panama.

The specimens (two records) reported from *T. cirrhosus* by Wenzel et al. (1966:551) have been reexamined and their identity as *S. ambigua* confirmed.

Genus *Parastrebla* Wenzel

Parastrebla Wenzel, 1966:578

Type Species: *Parastrebla handleyi* Wenzel, 1966:579

Parastrebla handleyi Wenzel
(Fig. 51A, 52C)

Parastrebla handleyi Wenzel, 1966:579, Fig. 116

The monotypic genus *Parastrebla* was based on a single female specimen from Panama. We can now add a description of the male.

Description

Male. Similar to the female in chaetotaxy of head, thorax, and legs. Sternum 2 and abdominal connexivum also very similar, but ventral connexivum lacking the transverse subapical row of coarser setae. Sternum 5 very broad, well developed, and covered with setae much like those of the connexivum but becoming very slightly longer distally; apical margin with ± 16 long setae, of which ± 12 are very long macrosetae. Sternum 6 absent. Hypopygium a rather broad cone.

Sternum 7+8 clothed with numerous setae of moderate length; 2 macrosetae on each side, one of these near inner margin, 1 on lateral

margin. Dorsodistal margin of tergum 9 with ± 6 conspicuously longer macrosetae, and a row of macrosetae along lateral-disto margin which became shorter ventrally; anterior to these is an irregular double row of short setae. Postgonites (Fig. 52C) stout, bladelike, curved, apices slightly hooked; each with a ventrolateral submarginal row of setae on a little less than distal half; ventral macrosetae inserted distal to shorter accessory setae, both pairs situated far posteriorly.

MEASUREMENTS

	Males	Females
BL	1.77-2.31	1.99-2.70
TL	0.59-0.81	0.59-0.83
WL	1.20-1.87	1.25-1.91
WW	0.76-0.96	0.73-0.93

VENEZUELAN SURVEY RECORDS (7 males and 5 females ex 7 *Micronycteris nicefori*)

BOLÍVAR: 7 males and 5 females, 28 km SE El Manteco, Los Patos, 150 m, 5-IV-66.

OTHER MATERIAL EXAMINED

BRAZIL. PARATYPE: 1 male and 1 female ex *Micronycteris* sp., Mananna, Utuza Forest, 1-XI-67, Thomas H. G. Aitken.

Genus *Pseudostrebla* Lima

Pseudostrebla Lima, 1921:23

TYPE SPECIES: Pseudostrebla ribeiroi Lima, 1921:23

The species of *Pseudostrebla* occur on bats of the genus *Tonatia*: *P. ribeiroi* Lima on *T. silvicola*; *P. greenwelli* Wenzel on *T. minuta*; and *P. sparsisetis* n. sp. on *T. carrikeri*. In the collection of Field Museum there are specimens of another undescribed species taken in Peru (Cuzco: Huajyumbe) from *T. venezuelae*.

Key to the Species of *Pseudostrebla*

1. Only 2 rows of setae, including the row of long antescutellars, between the scutellum and the transverse mesonotal suture. Costal vein with 2 conspicuous macrosetae which are twice as long as the others, 1 situated at the humeral crossvein, the other distal to it. MALE. Postgonites very short and strongly bent apically; with a ventral row of thornlike setae (Fig. 52D) ..... *sparsisetis* n. sp.

   At least 3 rows of setae present between the scutellum and the transverse mesonotal suture. Costal vein without conspicuously longer macrosetae at or beyond the humeral crossvein (though 1 may be present on basicosta). Postgonites as in Fig. 53A, B 2

2. Mesonotal setae rather uniformly distributed on scutum and prescutum. Setae at base of sixth wing vein only a little longer than those following. Hind tibiae scarcely longer than tarsi, with 5 very long macrosetae (Fig. 53C) ..... *greenwelli* Wenzel

   Mesonotal setae somewhat denser on scutum than on prescutum. Base of sixth wing vein with several moderately long macrosetae. Hind tibiae about ⅓ again as long as tarsi, with 6 macrosetae (Fig. 53D) ..... *ribeiroi* Lima

Pseudostrebla sparsisetis, new species
(Fig. 51B, 52D)

Pseudostrebla sparsisetis is a small species, like *P. greenwelli* Wenzel. It is easily distinguished from that species and from *P. ribeiroi* by the two very long conspicuous erect macrosetae on the costal vein, the sparsely and rather uniformly setose mesonotum, the four (rather than five or six) macrosetae on hind tibiae, and the very short, strongly bent male postgonites with short thornlike setae on their ventral margins.

DESCRIPTION

Head. Broad, broadly emarginate behind to accommodate the median anterior projection of the prescutum; laterovertices large, transverse, each with about 4 strong longer setae and 3 short ones, 1 strong seta present in the posterior division above the eye. Occipital lobes each with about 10 setae, those on inner half not quite as long as the others, lobes very narrowly separated at middle. Eyes each with about 10 facets. Palpi transverse, anterior margin emarginate near outer edge, with about 3 much longer setae and about 5 shorter ones; ventral face rather evenly covered with short setae and 1 longer one near inner apical margin. Theca broadly pyriform. Underside of head broadly funnel shaped, terminating posteriorly in a short knoblike lobe; area immediately behind the oral cavity bare, this area bounded by setae of varying sizes. *Thorax.* Transverse, mesonotum markedly broader than long; anterior margin with a bilobed median projection, this not as strong as in *riberoi* or *greenwelli*; margin ex-

cavated on each side of the projection for the reception of the occipital lobes. Median suture extending to the transverse suture, the latter indistinct on about middle third of its width; prescutum rather evenly, sparsely covered with setae of moderate length, some of those in the anterior angles distinctly longer, at least 1 along the basolateral angle. Scutum with similar discal setae and a row of 7 or 8 conspicuously longer setae in front of the scutellum; with only 2 transverse rows of discal setae immediately in front of the middle of the scutellum. Scutellum with 4 setae. Mesosternum strongly projecting between the coxae, anterior margin deeply, angulately emarginate; mesometasternum rather evenly covered with setae, these becoming slightly longer distally; mesosternum with conspicuously longer setae medial to coxae as well as a group of longer setae on outer edge. Metasternum slightly emarginate along apex; lateral margins with 9 or 10 longer setae on each side, including 2 or more distinctly longer macrosetae; disc also with at least 1 macroseta on each side inward from coxae. *Wings.* Costa with: a ventral row of setae that are distinctly longer than short dorsal setae of other veins; a marginal fringing row of much longer and stronger setae, the basal ones macrosetae, and a row of much coarser, sparser dorsally inserted setae, which, like the fringing setae, become shorter and much finer distally; and 2 extraordinarily long macrosetae, 1 inserted opposite humeral vein, the other distal to it. *R* and bases of *rs*, and third to fifth longitudinal veins bare excepting as follows: *R* with another unusually long macroseta similar to the 2 on costa, and 2 much shorter, fairly strong setae; stalk of the fourth and fifth longitudinal vein and base of fifth with a row of 3-4 strong macrosetae, basal angle of sixth with 2. *Legs.* Protibiae with 4 macrosetae, elsewhere covered with short setae. Mesotibiae with 4 macrosetae and a row of setae along dorsolateral margin, these distinctly longer than the other short tibial setae. Metatibiae with 5 macrosetae and, along outer dorsal edge, a row of somewhat longer setae. Hind tarsi nearly as long as tibiae, the last segment strongly compressed, no wider than the other dorsal segments; first tarsal segment with a couple of pairs of setae that are much stronger and longer than the others, which are mostly minute. Setae of costal margin consisting of a row of very strong long setae and a row of shorter macrosetae, which gradually become shorter to near junction with the first vein, and are uniform from that point to third longitudinal vein; seta at apex of third vein conspicuously longer than the others, nearly as long as the interval between the third and fourth vein; in addition to these there is a row of about 6 other strong and 2 strikingly long macrosetae, one inserted at humeral vein, the other distal to it on costa. Radius with 2 erect macrosetae, 1 much longer than the other. Vein *rs* with only 1 or 2 setae at apex, otherwise bare; third, fourth, and fifth longitudinal veins bare, lacking short setae on a large basal portion, but the fourth with about 3 macrosetae, the sixth with 2. *Abdomen.* Lateral lobes of tergum 1+2 with ± 1 coarse macroseta and a few shorter setae. Sternum 2 with a large triangular setose area which extends to base; ± 20 setae along distal margin conspicuously longer. Dorsolateral abdominal connexival setae longer than ventrals, becoming shorter ventrad; ventral setae distinctly shorter than discal setae on sternum 2, becoming somewhat longer near apex. Venter with the usual pair of segmental macrosetae. Setae of abdomen similar in both sexes but somewhat shorter in the male. Female. Tergum 7 very short, transverse, with a microseta on each side near margin. Supra-anal plate very short, with 4 slender setae. Seventh sternites with ± 11 setae, 4 near apical margin distinctly longer than 4 other macrosetae, remaining setae much shorter. Male. Sternum 5 covered with short setae similar to those of connexivum, becoming slightly longer distally; apical margin with ± 18 macrosetae most of them nearly as long as the fifth sternum, a couple of them conspicuously longer. Sternum 6 threadlike. Sternum 7+8 on each side with 11-12 setae including 2 conspicuous macrosetae, 2 slender setae medial to them, and posterior to these a group of 7-8 slender setae which are about half as long as the macrosetae. Tergum 9 with 5 macrosetae of varying lengths and distoventral surface with ± 10 setae which are about half as long as the longest macrosetae. Postgonites as in Fig. 52D.

Measurements

	Males	Females
BL	1.62-1.73	1.97
TL	0.57-0.59	0.59
WL	1.20-1.21	1.23
WW	0.74-0.77	0.74

Type Data: Male holotype (FMNH 88081) and female allotype (FMNH 87942) ex *Tonatia carrikeri*, Colombia, Meta: Los Micos, San Juan de Aroma, 1,300 ft, 16-IV-57, Kjell Von Sneidern. Paratypes—COLOMBIA. 2 males (FMNH), same data as the holotype; 4 males (FMNH 87942), same data as the holotype.

VENEZUELA. T. F. AMAZONAS: 1 male (in poor condition) and 1 female (USNM) ex *Tonatia carrikeri*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 10-IV-67.

Pseudostrebla greenwelli Wenzel
(Fig. 53A, C)

Pseudostrebla greenwelli Wenzel, 1966:582, Fig. 118A, C

VENEZUELAN SURVEY RECORDS (1 female ex 1 *Tonatia brasiliensis*)

T. F. AMAZONAS: 1 female, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 27-VII-67.

Pseudostrebla ribeiroi Lima
(Fig. 53B, D; 54)

Pseudostrebla ribeiroi Lima, 1921:23, Pl. 2, Fig. 4.—Wenzel, Tipton, and Kiewlicz, 1966: 582, Fig. 117, 118B, D

VENEZUELAN SURVEY RECORDS (3 females ex 3 *Tonatia silvicola*)

T. F. AMAZONAS: 2 females, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V—12-VI-67; 1 female, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 9-X-67.

Genus *Stizostrebla* Jobling

Stizostrebla Jobling, 1939b:273

TYPE SPECIES: *Stizostrebla longirostris* Jobling, 1939b:273

Stizostrebla longirostris Jobling
(Fig. 55)

Stizostrebla longirostris Jobling, 1939b:273, Fig. 2A-C.—Wenzel, Tipton, and Kiewlicz, 1966: 587, Fig. 119

VENEZUELAN SURVEY RECORDS (3 males, 1 female)

T. F. AMAZONAS: 3 males and 1 female ex 1 *Tonatia carrikeri*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 10-IV-67.

Genus *Strebla* Wiedemann

Strebla Wiedemann, 1824:19.—Wenzel, Tipton, and Kiewlicz, 1966:591

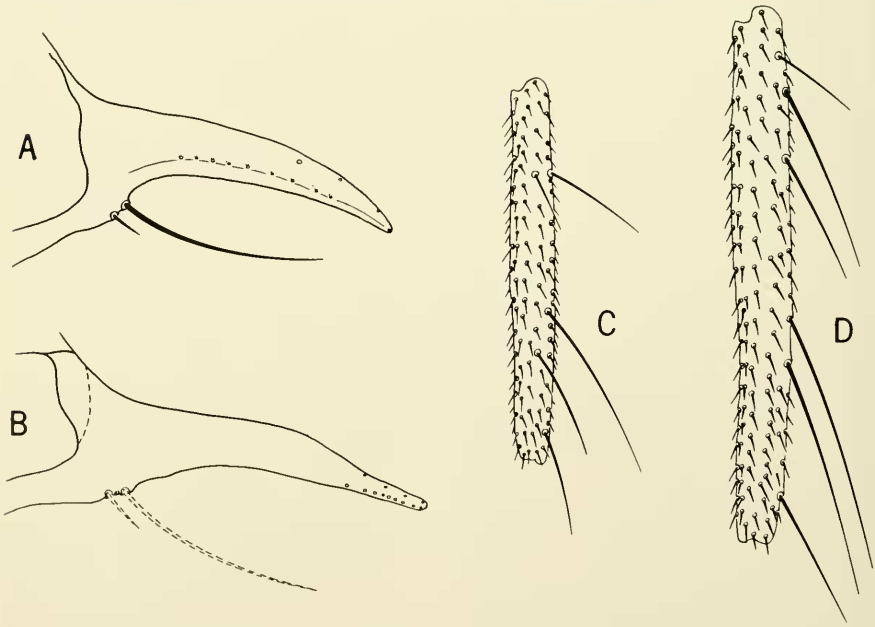

Fig. 53. A, C, *Pseudostrebla greenwelli* Wenzel: A, left male postgonite and C, metatibiae. B, D, *Pseudostrebla ribeiroi* Lima: B, left male postgonite, D, metatibiae. From Wenzel et al. (1966).

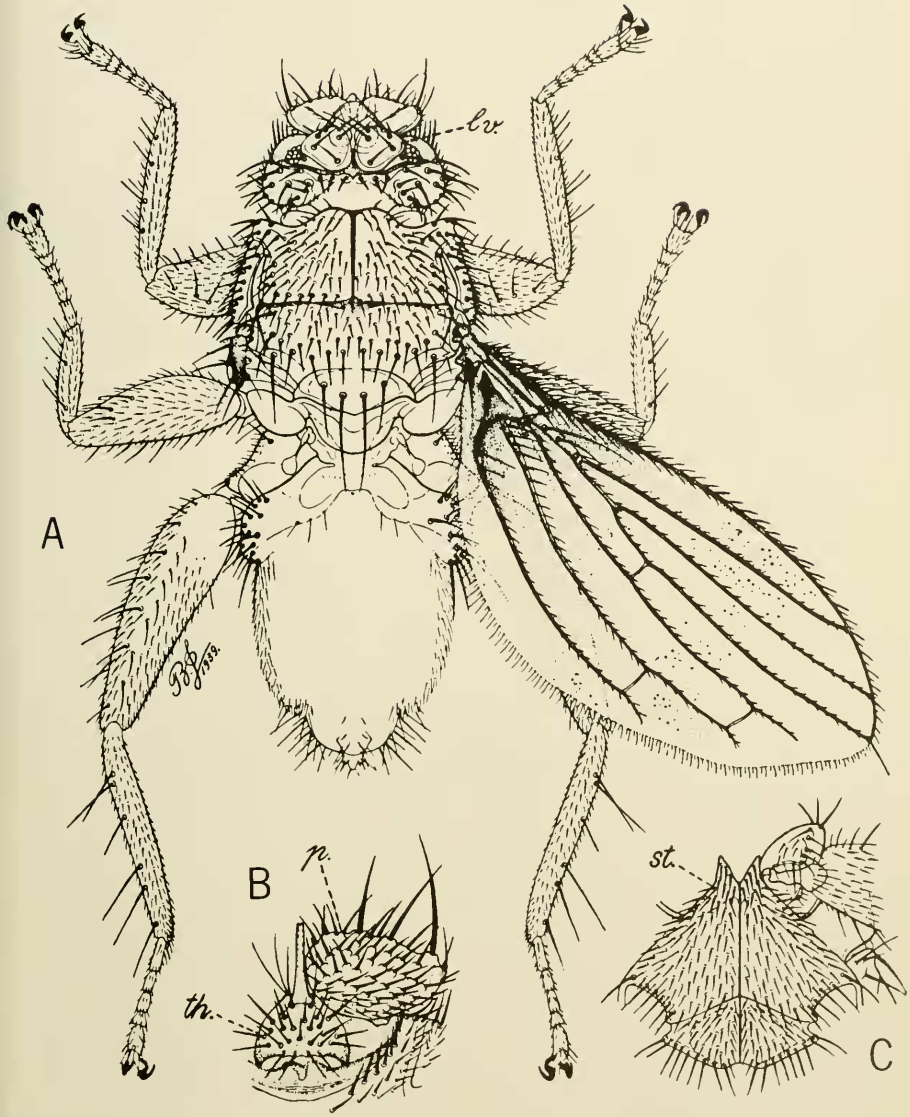

Fig. 54. *Pseudostrebla ribeiroi* Lima: A, female, dorsal view; B, mouthparts; C, meso-metasternum. From Jobling (1949).

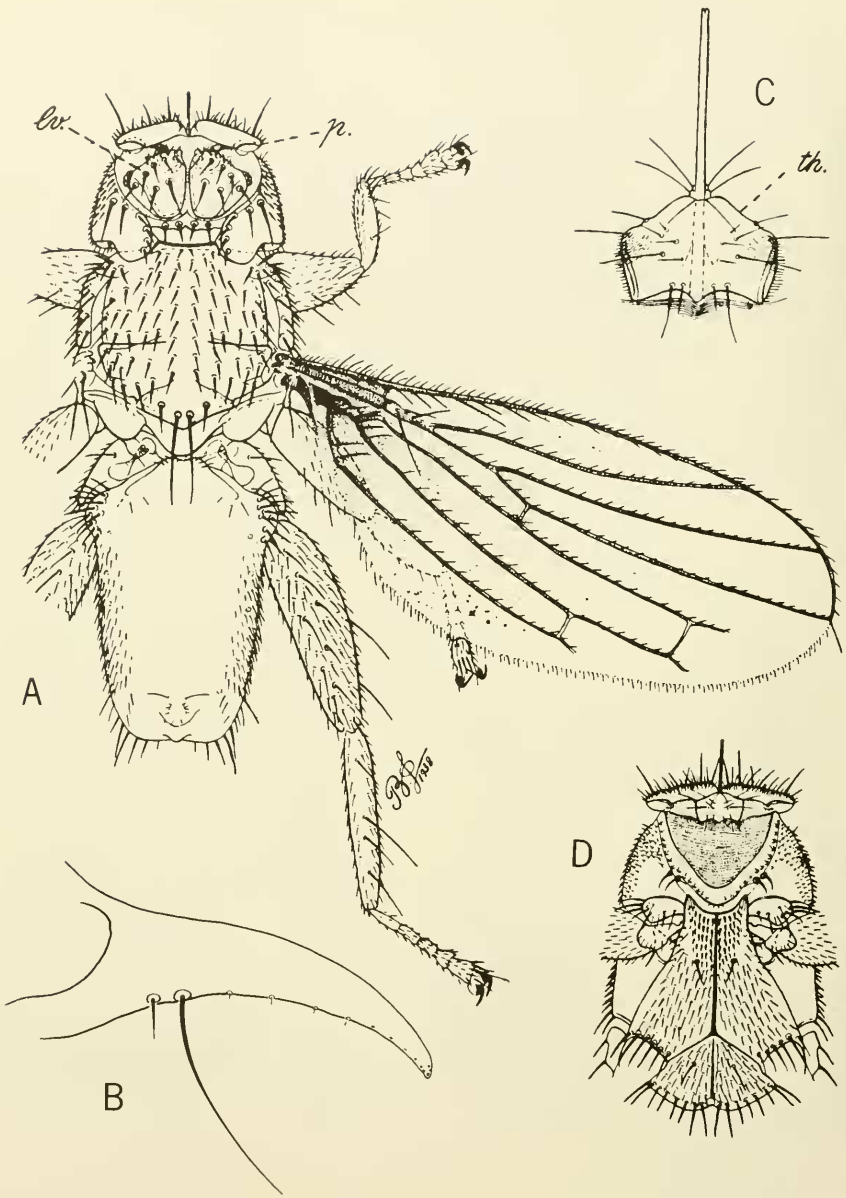

Fig. 55. *Stizostrebla longirostris* Jobling: A, female, dorsal view; B, left male postgonite; C, labium; D, underside of head and thorax. From Jobling (1949).

Type Species: *Strebla wiedemanni* Kolenati, 1856:46 (nom. nov. for [*Hippobosca*] *vespertilionis Fabricius*, 1805:339, suppressed by I.C.Z.N., 1936:29)

Euctenodes Waterhouse, 1879:310.—Garcia and Casal, 1965:5.

Type Species: *Euctenodes mirabilis* Waterhouse, 1879:310
Waterhouse, 1879:310

Dr. T. C. Maa called my attention to a valuable but scarce paper on the genus *Euctenodes* (= *Strebla*) by Garcia and Casal (1965). I was unaware of this when we (Wenzel et al., 1966; Wenzel, 1970) treated the species of *Strebla*. Dr. B. V. Peterson has kindly given me a Xerox copy. In this paper, Garcia and Casal described three new species and redescribed *E. tonatiae* Kessel and *E. mirabilis* Waterhouse. The specimen which they treated as *mirabilis* appears to be *S. wiedemannii* (*q.v.*). The species they described as new are, with one exception, synonyms. They are discussed below, where appropriate. These authors not only provided excellent illustrations but focused on some interesting character states not previously treated, especially the extent of longitudinal, nonsetose, areas on each side of the mesosternum.

In 1970, I inadvertently failed to list *Strebla mexicana* Rondani in the "Catalogue of the Diptera of the Americas . . ." This species is not identifiable until the type can be cleaned and studied (see Wenzel et al., op. cit., p. 610). Thirteen of the 16 previously named species are represented in the Venezuelan Survey Collections, as well as 9 new species described below. In the following key, I have included all of the known species of *Strebla* excepting *mexicana* Rondani. Following the key, the species are arranged alphabetically to facilitate referring to them.

Key to the Species of *Strebla*

1. Frontoclypeus entire [9] (Fig. 56B). The anterior (second) pigmented prescutal suture absent or indistinct 2
   Frontoclypeus with a pair of apical detached plates (Fig. 56A) or with an unsclerotized median suture. Anterior pigmented prescutal suture usually distinct (absent in *S. christinae*) 6

2. Upper edge of metatibiae with 2-3 conspicuously longer macrosetae (Fig. 59F) *hertigi* Wenzel
   Upper edge of metatibiae with 6-8 conspicuously longer macrosetae 3

3. Anterior margin of postvertex forming an obtuse angle (Fig. 58A); all festoon setae of postvertex and occiput slender. Epaulets continued across entire width of prescutum by a row of short coarser bristles behind the anterior margin ..... *diaemi* Wenzel
   Anterior margin of postvertex forming an angle less than or only slightly greater than 45°. Setae of postvertex and at least one of inner occipital setae (on each side) distinctly heavier than the others, often spinelike. Prescutal epaulets isolated on each side, not joined by a row of setae behind anterior margin 4

4. Apex of third longitudinal vein with a conspicuous macroseta. Eyes consisting of a single elongate hyaline lens, facets indistinguishable 5
   Bristle at apex of third longitudinal area only slightly longer and stronger than preceding setae. Eyes distinctly faceted ..... *consocia* Wenzel

5. Mesonotum (Fig. 64A) more sparsely setose, the prescutum with only 25-28 setae on each side behind the epaulets, not counting setae along lateral margins; scutum laterally with 2 irregular rows of setae between antescutellar row and transverse suture; setae of antescutellar row subequal ..... *hoogstraali* Wenzel
   Mesonotum (Fig. 64C) more densely setose, the prescutum with 42-46 setae on each side behind epaulets; scutum toward sides with 3 irregular rows of setae between antescutellar row and transverse suture; some lateral setae of antescutellar row distinctly longer than the median ones ..... *tonatiae* Kessel

6. Frontoclypeus with a median unsclerotized suture (Fig. 58F); postvertex and occipital lobes as in Fig. 57D ..... *galindoi* Wenzel

[9]The detached frontoclypeal plates in *matsoni* are relatively large but feebly pigmented and difficult to distinguish, but this species has an anterior pigmented prescutal suture, unlike the species of this alternative.

Frontoclypeus with a pair of apical detached plates, these sometimes feebly sclerotized (*matsoni*) or very small and difficult to detect 7

7. Eyes a single elongate, hyaline lens 8
Eyes multifaceted 9

8. Shape of postvertex similar to that of *hertigi* (q.v.), but with anterior margin more distinctly projecting in a point at middle; setae very short, only about half as long as postvertex. MALE. Apices of postgonites distinctly downwardly curved ..... *obtusa* n. sp.
Shape of postvertex as in Fig. 58D; setae as long as or longer than postvertex. MALE. Ventral margins of postgonites straight ..... *machadoi* Wenzel

9. Metatibiae with 2 dorsal rows of setae that are distinctly longer than the others, those of at least one row as long as or longer than greatest width of tibiae 10
Metatibiae with a single row of distinctly longer setae, some of which may be nearly as long as longest width of tibiae, or with dorsal setae not conspicuously longer than lateral setae; with 2 or 3 subapical macrosetae 11

10. Postvertex as in Fig. 58E. Abdominal connexival setae mostly short; the medioventral setae, with the exception of the pairs of longer segmentally arranged setae, no longer than discal setae of sternum 2. Metatibiae with 9-12 conspicuous macrosetae, most of them distinctly longer than greatest width of tibiae, much as in *consocia* (Fig. 59A). Male postgonites very strongly curved ..... *christinae* Wenzel
Postvertex as in Fig. 57B. Abdominal connexival setae longer, the ventromedial ones distinctly longer than discal setae of sternum 2. Metatibiae with two rows of dorsal setae that are longer than the others, many of them no longer than width of tibia, but which become gradually longer apically, the last seta of each row a distinctly longer and stronger macroseta (Fig. 59B). Male postgonites rather evenly and feebly curved ..... *wiedemanni* Kolenati

11. Anterior projection of postvertex very blunt (Fig. 56A) 12
Anterior margin of postvertex obtusely angulate, or with a median projection which may either be somewhat pointed or rounded but not broad and blunt 14

12. MALE. Postgonites very long and slender (Fig. 60E). FEMALE. Seventh sternites very large with 17-18 setae ..... *harderi* n. sp.
MALE. Postgonites not as long and slender (Fig. 60D). FEMALE. Seventh sternites with 15 or fewer setae 13

13. Anterior division of each laterovertex with 7 setae (not including seta inserted above eye). MALE. Each side of tergum 9 with 9-11 setae including 3-4 macrosetae along distal side margins, and 5-8 short setae behind them. FEMALE. Dorsolateral connexival setae shorter, subequal in length to those along middle of underside, none of them nearly as long as anterodorsal setae of lateral lobes of tergum 1+2. Seventh sternites with only 7-10 setae, including 4 macrosetae ..... *curvata* n. sp.
Anterior division of each laterovertex with 6 setae. MALE. Each side of tergum 9 usually with 4 macrosetae and 4 shorter setae. FEMALE. Dorsolateral connexival setae very long, nearly as long but not as coarse as anterior setae of lateral lobes of tergum 1+2. Seventh sternites each with 11-13 setae, including 2 very long macrosetae, the others fairly long, subequal ..... *guajiro* Garcia and Casal

14. Innermost 3-4 festoon setae of occipital plates very short and fine (Fig. 57G), though the first 1-2 may be very weak spinelets, none more than one-third as long as setae of postvertex ..... *altmani* Wenzel
1-2 or more inner festoon setae are strong spinelets or are longer and slender with the innermost setae more than half as long as setae of postvertex 15

15. All occipital setae of head fine, bristlelike, none of them spinelets (setae of postvertex may be coarser) 16
At least 1-2, usually 3-4, inner occipital setae on each side are spinelets 17

16. Head broader, ante-ctenidial area distinctly broader than long; anterior margin of postvertex broadly obtusely angulate; festoon setae of occipital lobes longer, the innermost setae of each occipital lobe usually about ⅔ as long as or subequal in length to setae of postvertex. Anterolateral longitudinal bare area on each side of mesosternum not extending posteriorly beyond procoxal cavity ..... *matsoni* n. sp.

Head long, length and width of ante-ctenidial area subequal. Anterior margin of postvertex forming an angle of 45° or less; festoon setae very short, the innermost seta of each lobe no more than ⅓ as long as setae of postvertex. Longitudinal bare areas of mesosternum extending distinctly beyond procoxal cavities 17

17. Four transverse rows of setae present laterally in the intervals between the transverse prescutal sutures. Female. Supra-anal plate with 2 pairs of discal setae in addition to the distal macrosetae. Male. Sternum 5 distinctly emarginate at middle, sometimes so deeply as to nearly divide it ..... *chrotopteri* n. sp.

No more than 2 or 3 transverse rows of setae laterally between the transverse prescutal sutures (sometimes 4 irregular rows in *diphyllae*) 18

18. Detached frontoclypeal plates comma shaped ..... *proxima* n. sp.
Detached frontoclypeal plates rectangular 19

19. Longitudinal bare area on each side extending almost the entire length of the mesosternum. Female. Seventh sternites very small, with only 4-6 setae. Male. Sternum 5 absent or indistinct; if recognizable then partially fused with sternum 6 and ventral arms of sternum 7+8, and sometimes with a single seta on apical margin near sides ..... *asternalis* n. sp.

Longitudinal bare area on each side of mesosternum extending midway between pro- and mesocoxal cavities or slightly beyond 20

20. Discal setae on each side, not including marginals, between transverse prescutal sutures arranged in 2 transverse rows (an extra seta inserted near outer edge of setose area sometimes gives the appearance of 3 rows) 21

Setae on each side between prescutal sutures arranged in 3 transverse rows 22

21. Measurements: TL, males, 0.58-0.59; females, 0.63-0.67. WL, males, 1.10-1.21, females, 1.35-1.37. Males. Apical portion of postgonites bent at about 45° from the long axis ..... *alvarezi* Wenzel

Measurements: TL, males, 0.65-0.71; females, 0.70-0.73. WL, males, 1.36-1.43; females, 1.50-1.59. Male. Postgonites strongly curved, the apical portion at right angles to the long axis ..... *cornurae* n. sp.

22. Festoon setae of postvertex and occipital lobes slender and strong but not spinelike (Fig. 58C). Mesonotum with dense setae (Fig. 61A). Female. Dorsolateral abdominal connexival setae as long as or subequal to anterodorsal setae of lateral lobes of tergum 1+2, but more slender ..... *diphyllae* Wenzel

Festoon setae of head stronger, spinelike (Fig 57A). Mesonotal setae sparser (Fig. 62A, 64F). Female. Dorsolateral connexival setae much shorter than anterodorsal setae of lateral lobes 23

23. Males 26
Females 24

24. Supra-anal plate with 4 macrosetae, lacking a pair of shorter discal setae ..... *paramarabilis* n. sp.

Supra-anal plate with 4 macrosetae and a pair of shorter discal setae, these situated between the macrosetae and the sutural groove separating the plate from tergum 7, the latter with the usual pair of very long macrosetae and a pair of shorter setae 25

25. Seventh sternites with 11-12 setae ..... *kohlsi* Wenzel
Seventh sternites with ± 15 setae ..... *mirabilis* Waterhouse

26. Tergum 9 with ± 11 setae (6 of them short). Postgonites rather evenly curved (Fig. 60C) ..... *paramirabilis* n. sp.
Tergum 9 with 16-17 setae (7-9 of them short). Postgonites usually angulately bent ..... *mirabilis* Waterhouse
kohlsi Wenzel

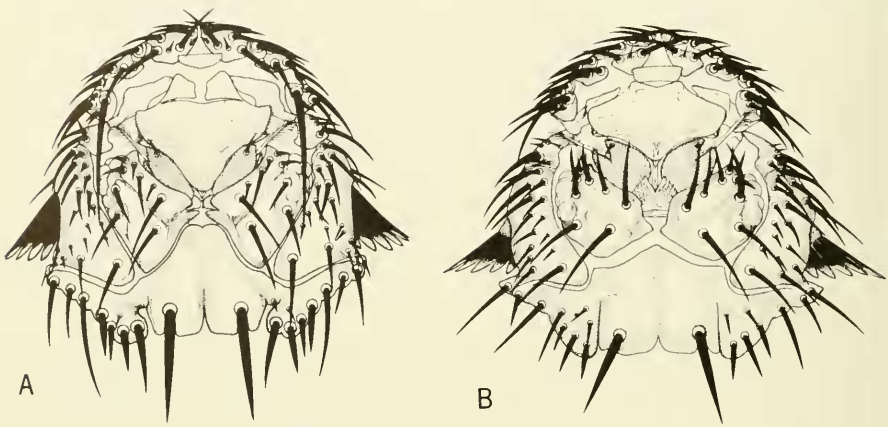

Fig. 56. Dorsum of head: A, *Strebla guajiro* (Garcia and Casal); B, *Strebla hertigi* Wenzel. From Wenzel et al. (1966; A as *Strebla carolliae*).

Strebla altmani Wenzel
(Fig. 57G, 63E)

Strebla altmani Wenzel, 1966:623, Fig. 123G, 137A.

VENEZUELAN SURVEY RECORDS (135 males, 98 females)

APURE: 40 males and 31 females ex *Lonchorhina orinocensis*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 6-28-XII-65; 3 males, same host, 1 km W Pto. Páez, Cerro de Murcielagos, Pto. Páez, 76 m, 19-24-I-66.

BARINAS: 2 males and 1 female ex *Lonchorhina aurita*, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67.

BOLÍVAR: 2 males ex *Lonchorhina aurita*, 20 km W La Paragua, Hato San José, 300 m, 8-IV-67.

CARABOBO: 1 male and 1 female ex *Lonchorhina aurita*, 10 km NW Urama, El Central, Urama, 25 m, 23-III-66.

DTO. FEDERAL: 2 males and 1 female ex *Lonchorhina aurita*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 380-398 m, 21-VIII-66.

MIRANDA: 2 males ex *Lonchorhina aurita*, 4 km SW Birongo, Cueva Walter Dupouy, Birongo, 195 m, 28-I-68; 4 males and 4 females, same host, Birongo, 60 m, 22-23-I-68.

T. F. AMAZONAS: 2 males and 1 female ex *Lonchorhina orinocensis*, 14 km SSE Pto. Ayacucho, El Gavilan, Pto. Ayacucho, 135 m, 11-X-67; 1 male and 1 female, same host, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 13-20-IX-67; 1 female, same host, 30 km S Pto. Ayacucho, Coromoto, Pto. Ayacucho, 126 m, 8-X-67; 1 male and 2 females ex 1 *Lonchorhina aurita*, 84 km SSE Esmeralda, 7 km up Río Mavaca, Boca Mavaca, 138 m, 2-III-67; 1 male ex 1 *Macrophyllum macrophyllum*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 25-VII-67.

TRUJILLO: 29 males and 18 females ex *Lonchorhina aurita*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 3-IX–6-X-65; 3 males and 4 females, same host, 23 km N Valera, nr. Agua Viva, Valera, 164 m, 30-VIII-65; 1 male, same host, 23 km NNW Valera, Río Motatan, Valera, 90 m, 8-X-65; 1 male and 2 females, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 18-IX-65; 9 males and 12 females, same host, 26 km N Valera, Quebrada Seca, Valera, 131 m, 21-X-65.

YARACUY: 2 males and 1 female ex *Lonchorhina aurita*, 20 km NW San Felipe, Minas de Aroa, 395-400 m, 6-23-XII-67.

ZULIA: 1 male ex *Lonchorhina aurita*, 65

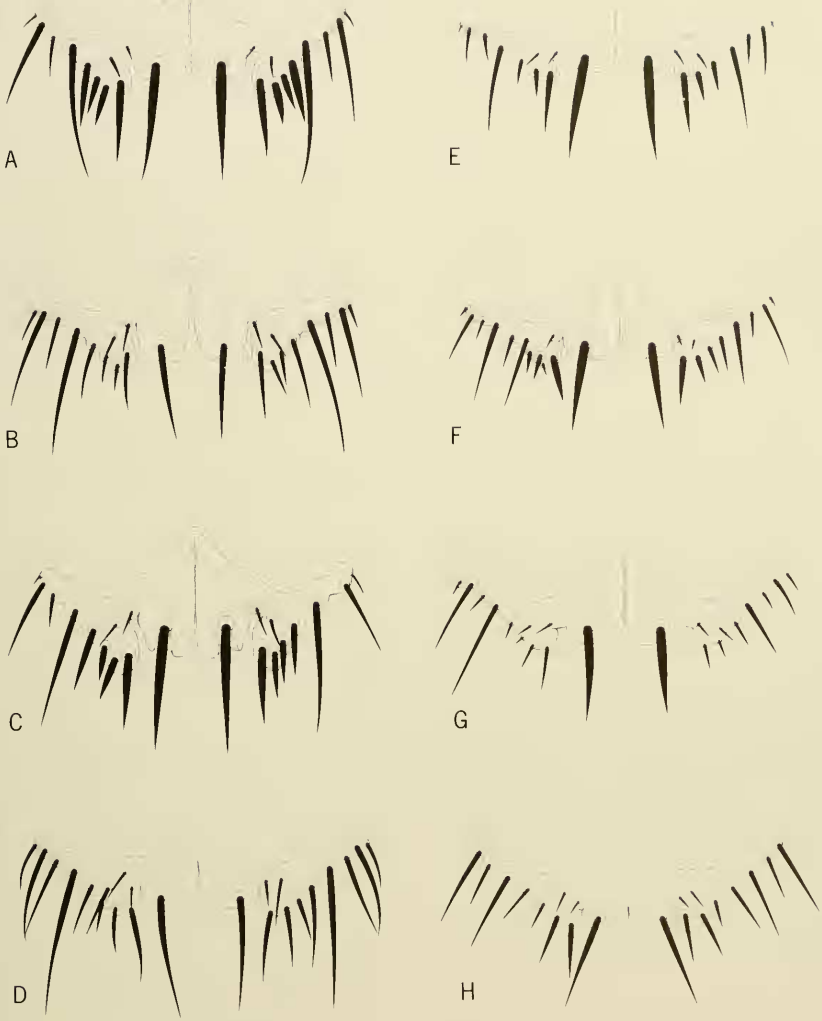

Fig. 57. Postvertex and occipital plates of species of *Strebla*: A, *Strebla mirabilis* (Waterhouse); B, *Strebla wiedemanni* Kolenati; C, *Strebla kohlsi* Wenzel; D, *Strebla galindoi* Wenzel; E-F, *Strebla alvarezi* Wenzel (E, Panama; F. Guatemala); G, *Strebla altmani* Wenzel; H, *Strebla hoogstraali* Wenzel. From Wenzel et al. (1966).

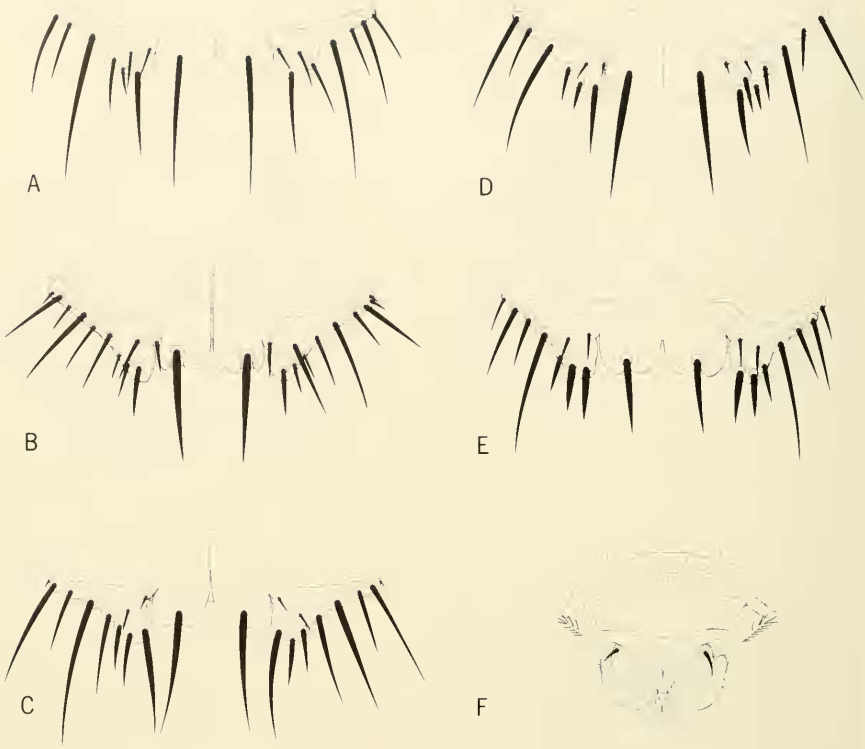

Fig. 58. A-E, postvertex and occipital plates (of head) of species of *Strebla*: A, *Strebla diaemi* Wenzel; B, *Strebla consocia* Wenzel; C, *Strebla diphyllae* Wenzel; D, *Strebla machadoi* Wenzel; E, *Strebla christinae* Wenzel. F, *Strebla galindoi* Wenzel: antennae and frontoclypeus. From Wenzel et al. (1966).

km WNW Encontrados, Caño Azul, El Rosario, 95 m, 25-III-68; 28 males and 18 females, same host, 21 km SW Machiques, Kasmera, 270 m, 15-20-IV-68.

Other Venezuelan Material Examined

ARAGUA: 12 paratypes ex *Lonchorhina aurita*, Rancho Grande, 18-VII—12-VIII-49, J. Racenis.

Remarks

In Panamanian specimens of *Strebla altmani*, the inner setae of the posterior margin of the occipital lobes are very short, fine, and evenly tapered. The presutal setae are rather sparsely distributed and arranged in three irregular transverse rows. In Venezuelan specimens from both *Lonchorhina aurita* and *L. orinocensis*, at least the innermost seta of the occipital lobes and sometimes the next one are less evenly tapered and appear more like spinelets, and the detached frontoclypeal plates are a little longer. The chaetotaxy of the mesonotum varies. In some areas, the specimens from L. orinocensis are very similar to those from Panama, but the discal presutal setae between the transverse sutures are arranged in two transverse rows, and toward each side another seta or two may be inserted between these to give the appearance of a third row. Many specimens from *L. aurita* have more numerous setae on both prescutum and scutum, those between the transverse presutal sutures clearly arranged in three rows. However, host associations of these forms are not consistent. Unfortunately, the number of specimens that

have been prepared on slides is not sufficient to further analyze the material statistically or in relation to host and geographic distribution.

The Venezuelan specimens could prove to represent two cryptic species, distinct from *altmani*, whose host relations shift geographically. The existence of two very similar species of *Trichobius* on the species of *Lonchorhina* in Venezuela, neither of them known from Panama, suggests such a possibility. One of these (*T. flagellatus*) was taken from both species of *Lonchorhina*.

Strebla alvarezi Wenzel
(Fig. 57E, F; 63G)

Strebla alvarezi Wenzel, 1966:625, Fig. 123E-F, 137B

Venezuelan Survey Records (6 males, 3 females)

BOLÍVAR: 3 males and 1 female ex *Micronycteris microtis*, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 3-V-68; 1 male ex 1 *Carollia brevicauda*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 9-VI-66.

FALCÓN. 1 female ex 1 *Glossophaga soricina*, 19 km NW Urama, Km 40, Urama, 25 m, 26-X-66.

T. F. AMAZONAS: 1 female ex 1 *Lonchophylla thomasi*, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 17-IX-67; 1 male ex *Micronycteris microtis*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 21-II-66.

YARACUY: 1 male ex 1 *Micronycteris megalotis*, 10 km NW Urama, El Central, Urama, 25 m, 8-III-66.

Host Associations

Of nine specimens of this scarce species that were collected in Venezuela by the survey teams, six (66 percent) were from three specimens of *Micronycteris microtis* and *M. megalotis*. The collection data suggest that the other host records are valid and may represent temporary transfers to other hosts which roost in some of the same situations as do species of *Micronycteris*. In Panama (Wenzel et al., 1966:626-627, 647-648), S. *alvarezi* was taken chiefly on various species of *Micronycteris* and *Saccopteryx bilineata*.

Strebla asternalis, new species
(Fig. 60F, 63I)

Strebla asternalis superficially resembles S. *machadoi* in the shape and chaetotaxy of the postvertex and occipital lobes, in the length of the longitudinal bare areas of mesosternum which extend nearly to apex in both species, and in the shape of the male postgonites, which are nearly straight, not curved. It is easily separated from *machadoi* by the multifaceted eyes, the even smaller female seventh sternites, the very sparsely setose sternum 2, and the absence of male sternum 5—or its presence as a vaguely sclerotized band which is irregularly fused to the lower arms of sterna 7+8 and sternum 6.

Description

Head. Elongate; chaetotaxy and postvertex as in *Strebla machadoi*, but eyes multifaceted and festoon setae of postvertex and occipital lobes generally a little more slender. Antetenidial area of underside distinctly longer than broad. *Thorax.* Chaetotaxy as in Fig. 63I. Prescutum with at least 5 strong epaulet setae and sometimes a short discal setae in the same row; setae of prescutal arcs quite long, some of them longer than innermost festoon setae of occipital lobes; 4-5 discal setae present anterior to each arc; setae in lateral intervals between prescutal sutures arranged in 3 rows, some of them quite long; central setae in front of the transverse suture markedly smaller. Scutum with ± 35 short setae and an antescutellar row of about 12 setae, some of them slightly longer than the discals, most of them at least twice as long. Longitudinal bare areas on each side of mesosternum extending nearly to mesocoxae. *Legs.* Mostly without distinctive characters. Metatibiae with outer dorsal row of setae longer than the others and becoming longer distally, 1 or 2 of them quite long and slender; 2 widely spaced macrosetae on about apical fourth. *Abdomen.* Sternum 2 very sparsely setose, with 16-24 discal setae, the posterior ones about twice as long; distal margin with 8-9 discal setae, 3 or 4 slightly longer than the longer discal setae, others twice as long, and 3 or 4 are much longer macrosetae which may be more than half as long as sternum. Dorsolateral, lateral, and ventral abdominal connexival setae subequal, a few of the medial setae on venter near apex a little longer; with the usual long, paired, segmentally arranged, ventral setae. Female. Tergum 7 lanceolate, narrower anteriorly, with a pair of subapical macrosetae and distal to these a pair of more closely placed short setae. Supra-anal plate with 4 very slender, long setae, sometimes with a pair of very short discal setae anterior to these. Seventh sternites very small, transversely oval, each with 4-6 setae, 3 or 4 of them usually slender macrosetae which may be nearly twice as long as a sternite is wide. Male. Sternum 5 absent or represented by a vague sclerotized area which may bear a seta in each lateral cor-

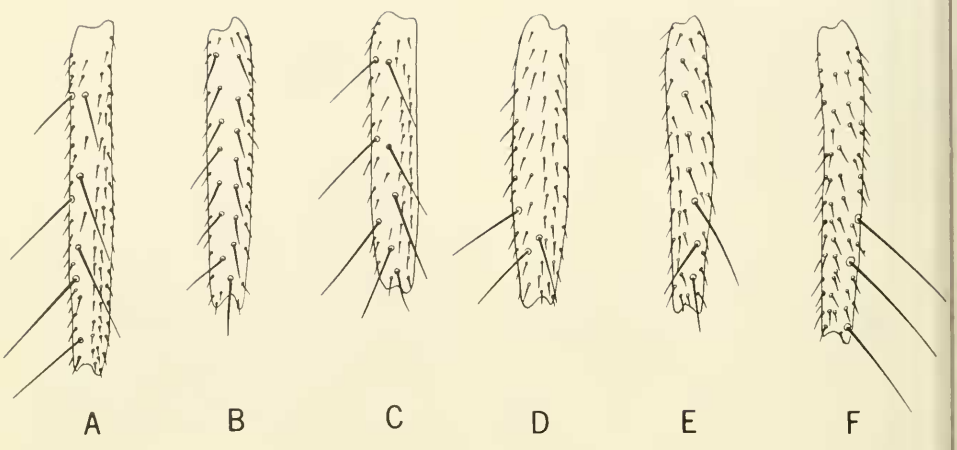

Fig. 59. Metatibiae, dorsal view, of species of *Strebla*: A, *Strebla consocia* Wenzel; B, *Strebla wiedemanni* Kolenati; C, *Strebla diaemi* Wenzel; D, *Strebla galindoi* Wenzel; E, *Strebla mirabilis* (Waterhouse); F, *Strebla hertigi* Wenzel. From Wenzel et al. (1966).

ner, is more narrow at middle and unevenly united with ventral arms of sternum 7+8 and Sternum 6. Sternum 7+8 on each side with 3 long dorsolateral setae, the middle one about twice as long as the others. Tergum 9 on each side usually with 2 laterodistal macrosetae, 2 shorter macrosetae below these and 2 short setae anterior to this row. Postgonites strongly narrowed from base to apex, slender distally, ventral margin nearly straight, curved only near base (Fig. 60F).

MEASUREMENTS

	Males	Females
BL	2.36-2.68	2.81-2.96
TL	0.90-1.48	0.94-0.96
WL	1.84-1.95	2.00-2.01
WW	0.80-0.91	0.88-0.92

TYPE DATA: Male holotype and female allotype ex *Saccopteryx bilineata* (SVP 17842), Venezuela, T. F. Amazonas, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-11-IV-67. PARATYPES—VENEZUELA. T. F. AMAZONAS: 8 males and 2 females, same data as the holotype; 5 males and 2 females ex 1 *Saccopteryx* sp., 84 km SSE Esmeralda, 9 km up Río Mavaca, Boca Mavaca, 138 m, 10-III-67; 3 males and 1 female ex *Saccopteryx bilineata*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I-67.

Strebla christinae Wenzel
(Fig. 7A, 58E, 62C)

Strebla christinae Wenzel, 1966:606, Fig. 44A, 124E, 131A

VENEZUELAN SURVEY RECORDS (114 males, 95 females)

APURE: 12 males and 4 females ex *Phylloderma stenops*, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 16-XII-65.

BOLÍVAR: 7 males and 5 females ex *Phylloderma stenops*, 20 km W La Paragua, Hato San José, 300 m, 6-IV-67.

FALCÓN: 1 male ex 1 *Carollia perspicillata*, 3 males and 1 female ex *Phylloderma stenops*, 19 km NW Urama, Km 40, Urama, 25 m, 25-X-65; 2 females, same host, 28 km WNW Pto. Cabello, Boca de Yaracuy, 2 m, 3-X-65; 4 males and 5 females, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 30-XI-67.

SUCRE: 7 males and 11 females ex *Phylloderma stenops*, 21 km E Cumaná, 1 m, 13-XII-66.

T. F. AMAZONAS: 1 female ex 1 *Eumops glaucinus*, 28 males and 11 females ex *Phylloderma stenops*, 163 km ESE Pto. Ayacucho,

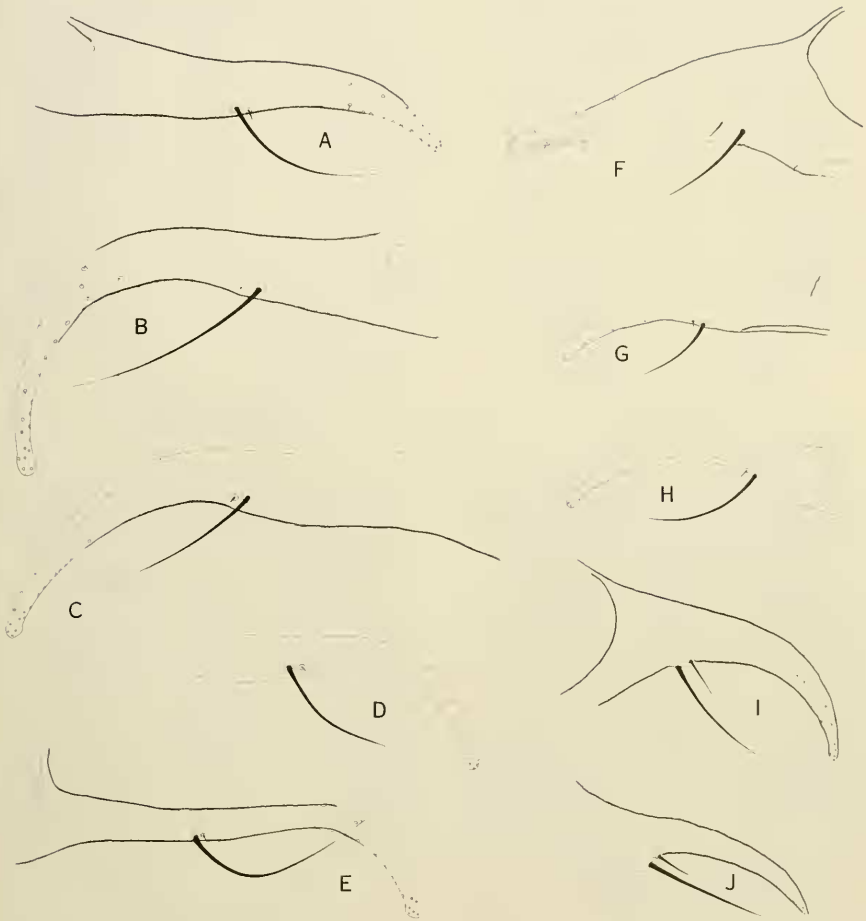

Fig. 60. Male postgonites: A, *Strebla obtusa*, new species (SVP 7743); B, *Strebla proxima*, new species (SVP 14931); C, *Strebla paramirabilis*, new species (holotype); D, *Strebla curvata*, new species (SVP 5552); E, *Strebla harderi*, new species (SVP 29349); F, *Strebla asternalis*, new species (SVP 16779); G, *Strebla matsoni*, new species (SVP 17737); H, *Strebla chrotopteri*, new species (SVP 14880); I, *Anastrebla spurrelli*, new species (SVP 8358); J, *Anastrebla caudiferae*, new species (SVP 10508).

Río Manapiare, San Juan, 155 m, 13-28-VII-67; 1 female ex 1 *Uroderma magnirostrum*, 3 males and 6 females ex *Phylloderma stenops*, Río Orinoco, 135 m, 20-IV–15-V-67; 25 males and 26 females, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 2-4-I-67; 7 males and 10 females, same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 6-VI-67; 9 males and 1 female, same host, 33 km S Pto. Ayacucho, El Raudal, Pto. Ayacucho, 195 m, 20-IX-67; 16 males and 20 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-14-IV-67.

HOST ASSOCIATIONS

Of 195 specimens of *Strebla christinae* collected by the survey teams, 192 (98.5 percent) were from *Phylloderma stenops*. The remaining 3 specimens were from 3 bats of 3 other species and probably are contaminants or represent temporary associations. The type series from Panama were also from *P. stenops*.

Strebla chrotopteri, new species
(Fig. 60H, 64E)

Strebla chrotopteri is easily distinguished from *S. mirabilis*, which it resembles, as well as from other species by the following combination of characters: the 4 transverse rows of setae between the prescutal sutures; the 2 pairs of discal setae on the female supra-anal plate; the strong emargination of male sternum 5 which sometimes is nearly divided into 2 sternites and which accommodates the angulately, anteriorly projecting fused ventral arms of sternum 7+8 and sternum 6; and the rather feebly curved male postgonites.

DESCRIPTION

Head. Virtually identical to that of *Strebla mirabilis* in general structure, shape of the postvertex and chaetotaxy; ante-ctenidial area about as long as wide; anterior division of each laterovertex usually with 9 setae. Eyes with about 8 facets. *Thorax.* Chaetotaxy as in Fig. 64E. Each epaulet usually with 4 (sometimes 3) setae, the inner seta generally weaker; prescutal arcs well defined, each with 5 long setae and, medially, continued to near apex of prescutum by shorter setae; intervals on each side between transverse sutures with setae in 4 irregular transverse rows. *Legs.* Very similar to those of *S. mirabilis*; metatibiae with outer row of dorsal edge slightly longer than the others and with 2 subapical macrosetae. *Abdomen.* Dorsolateral connexival setae long and slender in both sexes, but a little longer and much more extensive in the female, many of them as long as the longer setae of the antescutellar row; lateral and ventral setae subequal, the medioventrals a little longer and generally slightly longer than discal setae of sternum 2. Sternum 2 with 25-34 discal setae (average slightly smaller in males); posterior margin with 11-16 setae, 8-10 of them strong, mostly macrosetae, separated by several shorter setae which are often no longer than the discals, but which, like the other shorter marginals, may be twice as long as the discals; the innermost macroseta on each side may be more than half the length of the sternum. FEMALE. Tergum 7 elongate-oval, narrowed anteriorly, somewhat lanceolate; distally with a pair of macrosetae, and, posterior to these, a pair of more closely placed, shorter setae, these about half as long. Supra-anal plate with the usual 4 distal macrosetae and 2 pairs of short discal setae, the posterior pair a little longer and more widely separated. Seventh sternites fairly large, transverse, subreniform, anterior margin rather deeply emarginate; with 12-15 setae of varying lengths, a couple of them conspicuously longer and as long as sternites are wide; the shorter setae subequal to length (morphological) of sternites. MALE. Sternum 5 angulate, with posterior edge rather strongly, angulately emarginate at middle, sometimes nearly divided into 2 sternites; discal setae a little shorter than ventral connexivals, usually arranged in two (sometimes one) irregular rows laterally and in one row, or absent, at middle; distal margin with 11-16 longer setae, 8-10 of them macrosetae of varying lengths, the inner pair longest, at least twice as long as greatest length of sternum, the others becoming shorter laterad. Sternum 6 and 7+8 strongly bent anteriorly, corresponding to the emargination of sternum 5; each side of sternum 7+8 with a very long dorsolateral macroseta on each side and sometimes a shorter seta medial to it. Tergum 9 on each side with 3 (sometimes 2) thin dorsolateral macrosetae, and 3 long laterodistal macrosetae, 2 of them as long as the macrosetae of sternum 7+8; 7-9 short setae anterior to these. Postgonites rather long, feebly curved, macrosetae inserted near midlength (Fig. 60H).

MEASUREMENTS

	Males	Females
BL	2.72-3.39	2.86-3.20
TL	0.99-1.05	1.00-1.08
WL	1.87-2.04	1.97-2.13
WW	1.01-1.06	1.04-1.09

TYPE DATA: Male holotype ex *Chrotopterus auritus* (SVP 14882), Venezuela, Falcón, 11 km ENE Mirimire, nr. La Pastora, 220 m,

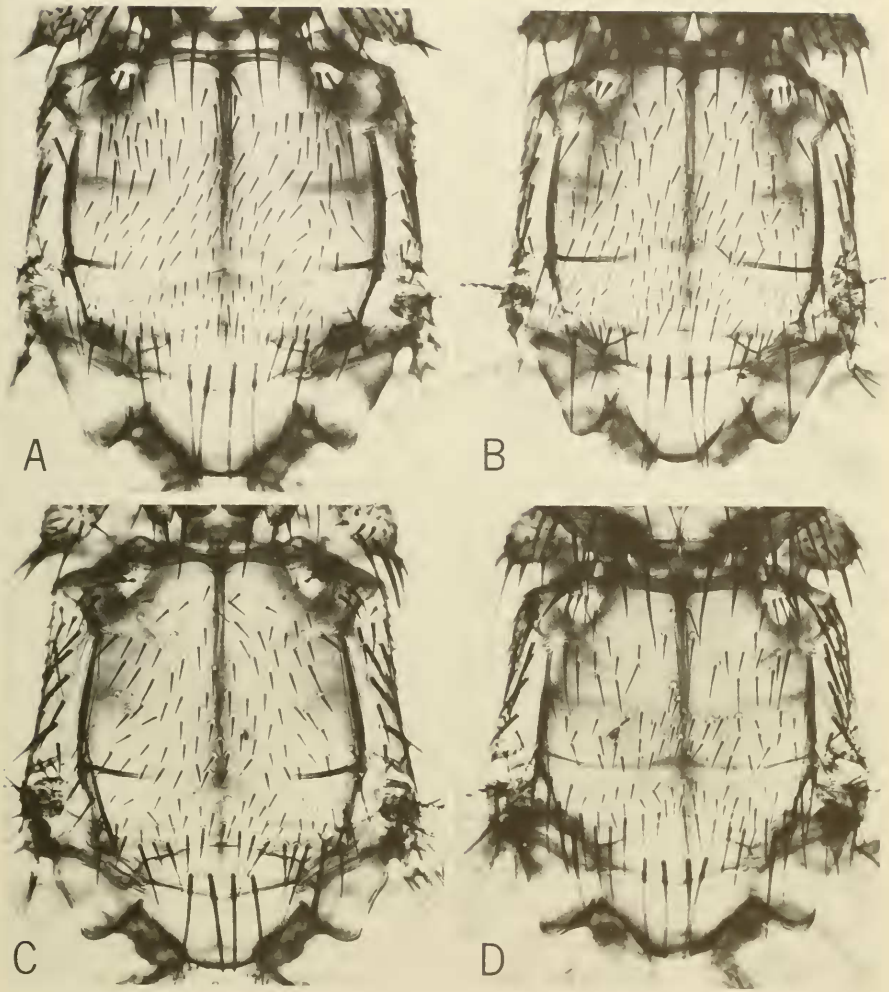

Fig. 61. Thorax, dorsal view: A, *Strebla diphyllae* Wenzel; B, *Strebla wiedemanni* Kolenati; C, *Strebla consocia* Wenzel; D, *Strebla galindoi* Wenzel. From Wenzel et al. (1966).

14-XI-67 and female allotype, same host (SVP 14880), 12 km ENE Mirimire, nr. La Pastora, 220 m, 14-XI-67. PARATYPES—VENEZUELA. BOLÍVAR: 3 males and 2 females ex *Chrotopterus auritus*, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 1-V-68. FALCÓN: 6 males and 4 females, same host and locality data as the holotype; 12 males and 6 females, same host and locality data as the allotype; 14 males and 9 females, same host, 1 male ex 1 *Chiroderma villosum*, 19 km NW Urama, Km 40, Urama, 25 m, 28-X—3-XI-65. T. F. AMAZONAS: 2 males and 3 females ex *Chrotopterus auritus*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 9-II-67; 10 males and 8 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-14-IV-67; 6 males and 7 females, same host, 163 km ESE Pto. Ayacucho, Río Manapaire, San Juan, 155 m, 26-VII-67. YARACUY/CARABOBO: 2 males and 3 females ex *Chrotopterus auritus*, 10 km NW Urama, Urama, 25 m, 17-X-65. ZULIA: 4 males and 2 females ex *Chrotopterus auritus*, 1 male ex 1 *Phyllostomus discolor*, 21 km SW Machiques, Kasmera, 270 m, 17-IV- 68.

HOST ASSOCIATIONS

Of 97 specimens of *Strebla chrotopteri* that were collected by the survey teams, 95 (98 percent) were from *Chrotopterus auritus*. The records from *Chiroderma villosum* and *Phyllostomus discolor* may represent contaminants, since specimens of *C. auritus* were collected at the same locality and on the same dates.

Strebla consocia Wenzel (emendation)
(Fig. 58B, 59A, 61C)

Strebla consocius Wenzel, 1966:600, Fig. 124B, 125A, 128

Euctenodes mirabilis, authors (part), not Waterhouse

VENEZUELAN SURVEY RECORDS (201 males, 175 females, 3 sex undet.)

APURE: 2 males and 4 females ex *Phyllostomus hastatus*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 30-31-I-68; 1 male ex *Phyllostomus elongatus*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 24-XII-65.

BARINAS: 1 male and 2 females ex *Phyllostomus hastatus*, 2 km SW Altamira, Altamira, 620 m, 26-XII-67; 4 males and 4 females, same host, 1 female ex 1 *Vampyrops helleri*, Altamira, 794 m, 21-XII-67.

BOLÍVAR: 1 female ex *Phyllostomus elongatus*, 25 km SE El Manteco, Los Patos, 150 m, 5-IV-66; 4 males and 4 females, same host, 50 km SE El Manteco, Río Supamo, 150 m, 11-IV-66; 1 female ex *Phyllostomus hastatus*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 17-VI-66; 1 male and 1 female, same host, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66.

CARABOBO: 1 male ex *Phyllostomus hastatus*, 2 km SE Montalbán, Potrerito, Montalbán, 598 m, 1-XI-67; 1 male, same host, 6 km N Urama, Urama, 60 m, 17-III-66.

FALCÓN: 1 male ex *Phyllostomus hastatus*, 80 km NW Carora, Río Socopito, 480 m, 20-V-68.

MIRANDA: 2 males and 5 females ex *Phyllostomus hastatus*, Birongo, 60 m, 22-23-I-68; 18 males and 20 females, same host, Cueva Alfredo Jahn, Birongo, 60-160 m, 20-I-68; 1 male, same host, 21 km NW Altagracia, Parque Nac. Guatopo, 630 m, 2-X-66.

MONAGAS: 1 male ex *Phyllostomus elongatus*, 4 males, 1 female, and 1 sex undet. ex *Phyllostomus hastatus*, 55 km SSE Maturin, Hato Mata de Bejuco, 18 m, 3-4-VI-68; 3 males and 5 females, same host, 3 km NW Caripe, nr. San Agustín, 1,175 m, 11-VII-67; 7 males and 3 females, same host, 5 km NW Caripe, San Agustín, 1,165 m, 26-VI-67.

SUCRE: 23 males and 23 females ex *Phyllostomus hastatus*, 26 km ESE Carúpano, Manacal, 175-370 m, 20-28-VII-67.

T. F. AMAZONAS: 2 males and 1 female ex *Phyllostomus elongatus*, 3 males and 2 females ex *Phyllostomus hastatus*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 20-II—24-III-67; 13 males and 16 females, same host, 2 males ex *Phyllostomus elongatus*, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V—7-VI-67; 3 males, same host, 2 males and 5 females ex *Phyllostomus hastatus*, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 6-IX—10-X-67; 30 males, 28 females, and 1 sex undet. ex *Phyllostomus elongatus*, 1 male and 2 females ex 1 *Trachops cirrhosus*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-14-IV-67; 28 males, 15 females, and 1 sex undet. ex *Phyllostomus hastatus*, 19 males and 10 females ex *Phyllostomus elongatus*, 1 male and 1 female ex 1 *Desmodus rotundus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-27-VII-67; 7 males and 8 females ex *Phyllostomus elongatus*, 3 males ex *Phyllostomus hastatus*, Río Orinoco, Tamatama, 135 m, 28-IV—8-V-67; 1 male and 2 females ex *Phyllostomus elongatus*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 16-II-67; 2 males ex *Phyllostomus hastatus*, 33 km S Pto. Ayacucho, El Raudal, Pto. Ayacucho, 195 m, 20-IX-67.

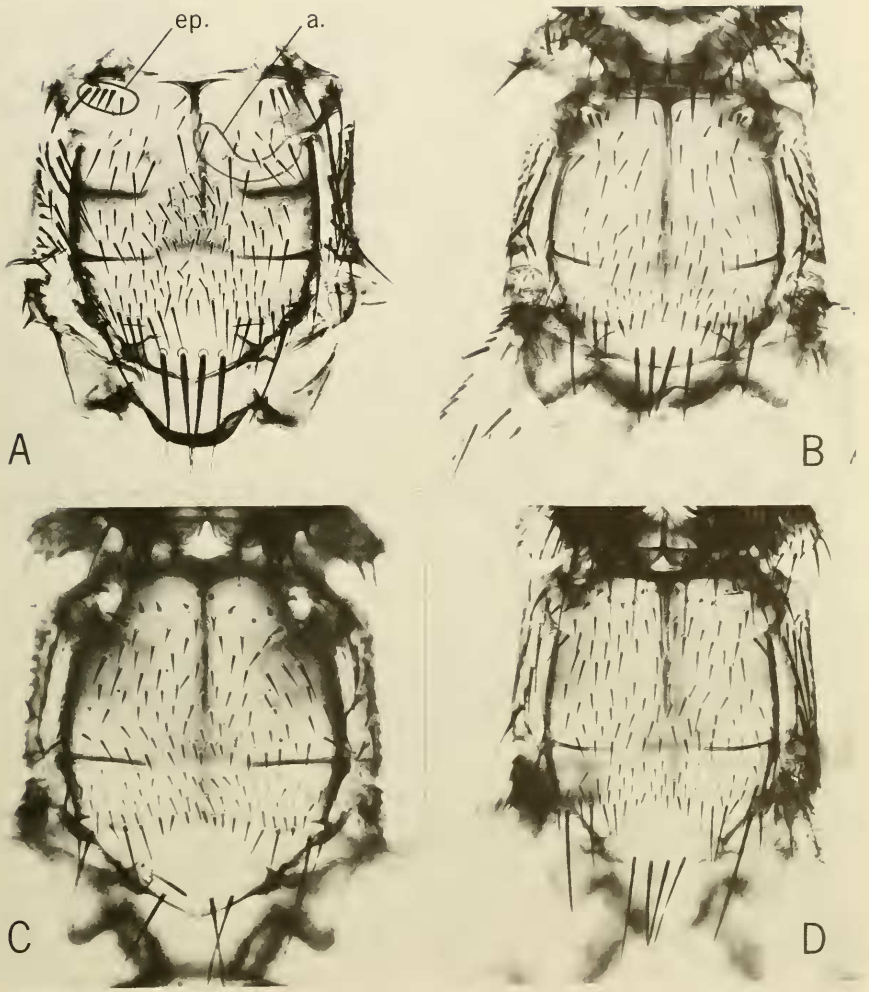

Fig. 62. Thorax, dorsal view: A, *Strebla mirabilis* (Waterhouse); B, *Strebla hertigi* Wenzel; C, *Strebla christinae* Wenzel; D, *Strebla diaemi* Wenzel. *ep.* = epaulet seta; *a.* = prescutal arc of setae. From Wenzel et al. (1966).

TRUJILLO: 6 males and 5 females ex *Phyllostomus hastatus*, 23 km NNW Valera, Río Motatan, Valera, 90 m, 2-IX-65.

YARACUY: 2 males and 1 female ex *Phyllostomus hastatus*, 11 km NW Urama, El Central, Urama, 25 m, 14-22-III-66.

ZULIA: 4 females ex *Phyllostomus hastatus*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III–1-IX-68.

OTHER VENEZUELAN MATERIAL EXAMINED

MIRANDA: 1 male ex *Carollia* sp., Alfredo Jahn Cave, 7-V-61, J. Racenis, J. Ojasti, and C. Bordón.

HOST ASSOCIATIONS

Of 379 specimens of *Strebla consocia* that were collected by the survey teams, 247 (65 percent) were from 83 *Phyllostomus hastatus*, 125 (33 percent) ex *P. elongatus*, and 7 (2 percent) were from 4 bats of 4 other species. Some of the specimens from the miscellaneous hosts are probably contaminants, and I suspect that this is true of the specimens from *Trachops cirrhosus*, too, since all other specimens of that host that were collected at the same locality and on the same date as those from which *S. consocia* are reported were parasitized as usual by *S. mirabilis*. For a discussion of the subspecies of *P. hastatus* and the species of *Strebla* that parasitize them, see Wenzel and Tipton (1966:682-687).

The records from *Phyllostomus elongatus* are of special interest, since, as noted above, these bats do not appear to be parasitized by any parasites that are specific to them, but by species that are common parasites of other hosts.

Strebla cormurae, new species
(Fig. 63B)

Strebla cormurae is slightly larger than *S. alvarezi* Wenzel and, except for the shape of the male postgonites, is almost indistinguishable from that species in form, structure, and chaetotaxy. In *S. cormurae* the distal portion of the postgonites is strongly curved at right angles to the long axis. In *alvarezi* the postgonites are only moderately bent, at about 45° from the long axis. The description of *S. alvarezi* Wenzel applies equally well to *cormurae*, and the following includes only exceptions and additions to that description.

DESCRIPTION

With the general characters and chaetotaxy of *Strebla alvarezi* Wenzel (1966:625), but slightly larger. As in *alvarezi*, the bare longitudinal area on each side of the mesosternum extends about midway between meso- and metacoxae. *Abdomen.* FEMALE. Seventh sternites each with 8-9 setae, 6-7 of these being macrosetae, 1 or 2 of them longer than the others but not longer than maximum width of sternite (similar in *alvarezi* but 4-5 of the setae short, 1 or 2 of the macrosetae a little longer than maximum width of sternite). MALE. Postgonites strongly curved, the apical portion at right angles to the long axis; very similar to those of *S. proxima* (Fig. 60B) but a little longer and more slender.

MEASUREMENTS

	Males	Females
BL	1.90-2.12	1.95-2.02
TL	0.65-0.71	0.70-0.73
WL	1.36-1.43	1.50-1.59
WW	0.70-0.72	0.70-0.76

TYPE DATA: Male holotype and female allotype ex *Cormura brevirostris* (FMNH 95357), Suriname, Saramacca, Nickerie, Wilhelmina Mts., West River, I-62, H. A. Beatty (FMNH Guianan Zool. Exped., 1960-62). PARATYPES —SURINAME: 2 males and 1 female, same data as the holotype; 5 males and 5 females, same data as the holotype but X-61. VENEZUELA. T. F. AMAZONAS: 1 male and 1 female ex 1 *Cormura brevirostris*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 19-I-67.

Strebla curvata, new species
(Fig. 60D, 63F)

Strebla carolliae Wenzel, 1966:619, in part (paratype from El Salvador)

Strebla curvata is most similar to *S. guajiro*, but smaller, with distinctly shorter dorsolateral abdominal connexival setae, more numerous setae on tergum 9 of the male, fewer setae on the seventh sternites of the female (7-10 as opposed to ± 15), and 7 as opposed to 6 setae on the anterior division of each laterovertex. It is also similar to *S. harderi* n. sp. (see below) but is distinguishable from that species by the characters given in the key. The following description includes chiefly characters by which *curvata* differs from *guajiro* or which were not mentioned in the description of that species (as *carolliae* Wenzel, 1966:619).

DESCRIPTION

Smaller than *Strebla guajiro*. *Head.* Postvertex as in *guajiro*; anterior division of each laterovertex with 7 setae, not including the seta inserted above the eye (which is on the posterior

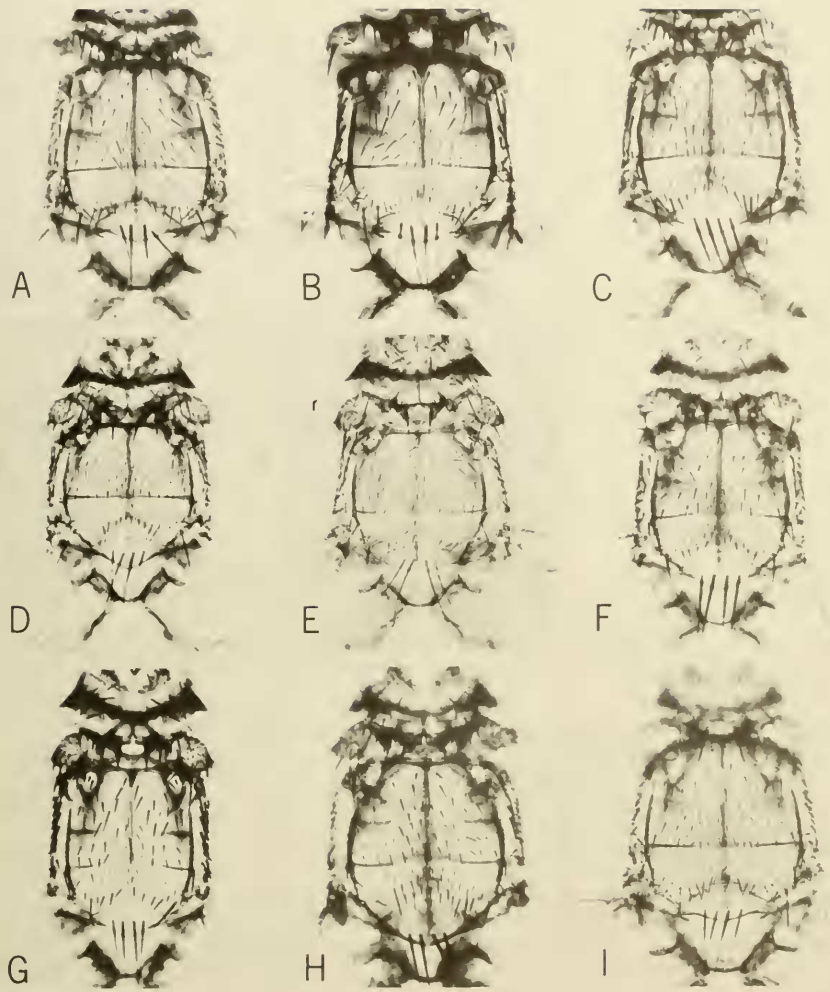

Fig. 63. Thorax, dorsal view: A, *Strebla proxima,* new species, female (SVP 14936); B, *Strebla cormurae,* new species, male (FMNH 95357); C, *Strebla harderi,* new species, female (SVP 8336); D, *Strebla matsoni,* new species, male (SVP 16870); E, *Strebla altmani* Wenzel, male; F, *Strebla curvata,* new species, female (SVP 9343); G, *Strebla alvarezi* Wenzel, male; H, *Strebla obtusa,* new species, female (SVP 7448); I, *Strebla asternalis,* new species, male (SVP 16779). E, G from Wenzel et al. (1966).

division); detached frontoclypeal plates rectangular, either slightly longer than broad or square. *Thorax.* Chaetotaxy as in *guajiro*. *Abdomen.* Dorsolateral connexival setae distinctly shorter than in *guajiro*, of about the same length as the ventromedial setae, those of the female not nearly as long as the shorter anterodorsal setae of the lateral lobes of tergum 1+2. Sternum 2 with ± 10 marginal setae, all longer than the discals, about 4 of them longer macrosetae. FEMALE. Tergum 7 teardrop shaped, similar to that of *guajiro* but usually not as strongly narrowed anteriorly. Seventh sternites short, transverse, subreniform, with ±7 setae, including 4 macrosetae, one of these shorter than the others. Ventral arc with a short triangular lobe. MALE. Sternum 5 broadly emarginate posteriorly, the lateral portions with 2 transverse rows of discal setae; posterior margin with from 14-16 setae of which 6-10 may be macrosetae, the others shorter but longer than the discals. Sternum 7+8 with a single very long dorsolateral macroseta on each side. Tergum 9 on each side with 3-4 laterodistal macrosetae, the lower one shortest; anterior to these are 5-8 other short setae (4 in *guajiro*). Postgonites similar to those of *guajiro* but more evenly and less strongly curved, the ventral setae inserted slightly more distad.

MEASUREMENTS

	Males	Females
BL	2.02-2.14	2.00-2.48
TL	0.71-0.80	0.76-0.85
WL	1.35-1.48	1.52-1.62
WW	0.68-0.74	0.74-0.79

TYPE DATA: Male holotype ex *Glossophaga soricina* (SVP 9276), Venezuela, Bolívar, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-VI-66 and female allotype, same host (SVP 9406), same locality data but Km 67, 16-VI-66. PARATYPES—VENEZUELA. APURE: 1 female ex 1 *Noctilio labialis*, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 14-XII-65; 2 males and 2 females ex *Glossophaga longirostris*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 6-9-XII-65. BARINAS: 1 female ex 1 *Carollia brevicauda*, 4 males ex 2 *Carollia perspicillata*, 2 km SW Altamira, Altamira, 620 m, 27-28-XII-67. BOLÍVAR: 1 female ex *Glossophaga soricina*, 56 km SE El Dorado, Km 67, El Manaco, 150 m, 16-VI-66; 2 males and 2 females, same host and locality data as the holotype but 13-21-VI-66; 1 male and 2 females, same host, 20 km W La Paragua, Hato San José, 300 m, 4-7-IV-67. FALCÓN: 1 male ex *Glossophaga soricina*, 14 km ENE Mirimire, nr. La Pastora, 122 m, 11-XI-67; 3 males and 2 females, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-XI–1-XII-67; 2 males, same host, 13 km ESE Mirimire, nr. San Pablo, 270 m, 17-XI-67; 2 males and 1 female ex *Glossophaga longirostris*, 20 km NNE Mirimire, nr. Aguide, 1-5 m, 13-XI-67. GUAJIRA: 1 male ex *Glossophaga longirostris*, 44 km NNE Paraguaipoa, nr. Cojoro, 50 m, 28-VI-68. NUEVA ESPARTA: 1 male ex *Glossophaga longirostris*, 3 km NNE La Asunción, Isla Margarita, 37 m, 7-I-67; 1 male and 1 female, same host, 3 km S La Asunción, Isla Margarita, 53-57 m, 31-I–2-II-67. MIRANDA: 2 males and 3 females ex *Glossophaga soricina*, Birongo, 60 m, 22-23-I-68. MONAGAS: 1 female ex *Glossophaga soricina*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68. T. F. AMAZONAS: 1 male ex *Glossophaga longirostris*, 20 km S Pto. Ayacucho, Las Queseras, Pto. Ayacucho, 135 m, 27-IX-67; 2 males, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-X-67; 5 males and 1 female ex *Glossophaga soricina*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 2-3-I-67; 5 males and 5 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 6-27-VII-67; 3 males, same host, Río Orinoco, Tamatama, 135 m, 2-4-V-67.

OTHER MATERIAL EXAMINED

El Salvador, Morazan: 1 female (Senckenberg Museum, paratype of *Strebla carolliae* Wenzel) ex *Glossophaga soricina leachii*, Mineral Encuentro, 19-VI-53, H. Felten.

HOST ASSOCIATIONS

Of 63 specimens of *Strebla curvata* that were collected by the survey teams, 57 (90.5 percent) were from species of *Glossophaga*, 33 (52.4 percent) ex 34 *Glossophaga soricina*, and 14 (22 percent) ex 12 *G. longirostris*. Of the remaining 6 specimens, 4 (6.3 percent) were from 2 *Carollia perspicillata*, 1 ex *C. brevicauda*, and 1 ex *Noctilio labialis* (!). It is interesting that this new species—which is so similar to *S. guajiro*, the characteristic species of *Strebla* on species of *Carollia*—was occasionally taken from species of *Carollia* in Venezuela, but not together with *S. guajiro*. *Strebla curvata* was not taken from *Glossophaga soricina* in Panama, although *S. guajiro* was (Wenzel loc. cit.).

REMARKS

The number and length of the setae on posterior margins of sternum 2 in both sexes, and

of sternum 5 of the male, vary greatly in *S. curvata*, *S. guajiro*, and *S. harderi*. In general, they are not apt to be quite as long and strong in *curvata* and in *harderi* as they are in *guajiro*. Further, these two species are usually less strongly pigmented than is *guajiro*.

Strebla curvata is the first species of the genus *Strebla* that appears to be a characteristic parasite of bats of the genus *Glossophaga*.

Strebla diaemi Wenzel
(Fig. 58A, 59C, 62D)

Strebla diaemi Wenzel, 1966:599, Fig. 124A, 125C, 127A

Venezuelan Survey Records (57 males, 44 females ex 13 *Desmodus youngi*)

FALCÓN: 1 female, 80 km NW Carora, Río Socopito, 480 m, 25-V-68.

SUCRE: 14 males and 13 females, 21 km E Cumaná, 1 m, 20-23-XII-66; 1 male and 3 females, 9 km NE Güiria, Ensenada Cauranta, 4 m, 5-VI-67.

T. F. AMAZONAS: 6 males and 1 female, 14 km SSE Pto. Ayacucho, Chaparito, Pto. Ayacucho, 119 m, 2-X-67; 15 males and 3 females, 28 km S Pto. Ayacucho, Guayabal, Pto. Ayacucho, 135 m, 7-X-67; 20 males and 22 females, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 17-18-VII-67.

ZULIA: 1 male and 1 female, 42 km WNW Encontrados, El Rosario, 24 m, 4-III-68.

Host Associations

Desmodus youngi is the only host known for *Strebla diaemi*.

Strebla diphyllae Wenzel
(Fig. 58C, 61A)

Strebla diphyllae Wenzel, 1966:613, Fig. 124C, 133.

Although *Strebla diphyllae* was not recovered from the 11 specimens of the type host, *Diphylla ecaudata*, that were collected by the survey teams, I believe that it will be found in Venezuela. Since describing this species, I have received additional specimens from Colombia (Vaupes: Río Inirida, Cerro de la Pinturas) and Brazil (Para: Río Gurupi, Caninde). Wenzel et al. (loc. cit.) reported specimens of a supposedly new species from *Diphylla* that were collected from *Diphylla ecaudata* in Aragua (Rancho Grande, El Limón). These proved to be *S. mirabilis*.

Strebla galindoi Wenzel
(Fig. 57D, 58F, 59D, 61D)

Strebla galindoi Wenzel, 1966:604, Fig. 123D, 124F, 125D, 130

Venezuelan Survey Records (33 males, 27 females)

APURE: 1 male and 1 female ex *Tonatia bidens*, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 14-XII-65; 1 male, same host, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 24-I-68.

BOLÍVAR: 2 females ex *Tonatia bidens*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 22-VI-66.

FALCÓN: 28 males and 20 females ex *Tonatia bidens*, 1 female ex *Sturnira lilium*, 19 km NW Urama, Km 40, Urama, 25 m, 25-X–4-XI-65.

MIRANDA: 2 males and 2 females ex *Tonatia bidens*, Birongo, 60 m, 23-I-68.

T. F. AMAZONAS: 1 male and 1 female ex *Tonatia bidens*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 10-IV-67.

Host Associations

The 59 specimens of *Strebla galindoi* collected by the survey teams were taken from 10 *Tonatia bidens*, the only host known for this streblid.

Strebla guajiro (Garcia and Casal), new combination
(Fig. 56A)

Euctenodes guajiro Garcia and Casal, 1965:14, Fig. 10-16

Euctenodes mirabilis, authors (part) not Waterhouse, new synonym

Strebla carolliae Wenzel, 1966:619, Fig. 122A, 136, new synonym

The female type of *Strebla guajiro* was collected in Venezuela, (Aragua: Campamento Rangel) on *Noctilio labialis labialis* (!) together with the male allotype and seven female and six male paratypes. Although I have not seen any of the type material, it is clear from the excellent illustrations of *S. guajiro* that it is conspecific with *S. carolliae* Wenzel. The host given for the type series of *guajiro* is almost certainly in error. I have never seen a confirmed record of any species of *Strebla* from either of the two species of *Noctilio*. *Strebla guajiro* is a characteristic parasite of species of *Carollia*, and in some areas, e.g., Panama, it has been reported (Wenzel et al., loc. cit.) from *Glossophaga soricina*.

In their table (loc. cit., p. 10) summarizing the known hosts of species of *Euctenodes*, Garcia and Casal also list "leaf nosed short tailed" bat as an additional host for *E. guajiro*.

VENEZUELAN SURVEY RECORDS (343 males, 242 females, 1 sex undet.)

This common parasite of species of *Carollia* was taken at 76 localities in 13 states, as follows: Apure (3 localities, 24-76 m); Barinas (5 localities, 611-1,070 m); Bolívar (10 localities, 150-1,042 m); Carabobo (6 localities, 25-1,537 m); Falcón (8 localities, 2-1,260 m); Guárico (2 localities, 470-630 m); Miranda (5 localities, 1-1,180 m); Monagas (4 localities, 18-1,345 m); Sucre (4 localities, 1-380 m); T. F. Amazonas (14 localities, 114-155 m); Trujillo (4 localities, 90-164 m); Yaracuy (2 localities, 25-400 m); and Zulia (8 localities, 37-270 m).

OTHER VENEZUELAN MATERIAL EXAMINED

ARAGUA: 1 sex undet. ex *Carollia perspicillata*, Rancho Grande (El Limón), 30-III-60, C. O. Handley, Jr.

MONAGAS: 2 males and 2 females ex *Carollia p. perspicillata*, Guacharo Cave ("Cerro de la Cueva"), 900 m, 16-VIII-62, J. Ojasti.

HOST ASSOCIATIONS

Of 586 specimens of *Strebla guajiro* collected by the survey teams, 523 (89.2 percent) were from 348 *Carollia perspicillata*, 51 (8.7 percent) ex 47 *C. brevicauda*, 3 (0.51 percent) ex 3 *Carollia* sp., and the remaining 9 specimens were from 9 bats of 9 species. These 9 are probably contaminants or represent transitory transfers. Of the specimens from *C. brevicauda*, 47 (92 percent) were taken at elevations above 600 meters.

REMARKS

I am unable to distinguish between specimens of *Strebla guajiro* from *Carollia perspicillata* and *C. brevicauda*, but further studies may demonstrate that they are specifically distinct, as is true for the alloxenous species of *Speiseria* and *Trichobius* that parasitize these two hosts in Venezuela and elsewhere.

Strebla harderi, new species

(Fig. 60E, 63C)

Strebla harderi is very similar to *S. guajiro* and *S. curvatus*. It is distinctive in its large female seventh sternites with 17-18 setae and, especially, the very long slender male postgonites. It also differs from these species in that the longitudinal bare area on each side of the mesosternum extends posteriorly only a little beyond the procoxal cavity rather than to nearly midway between pro- and mesocoxal cavities.

The following description includes characters by which *S. harderi* differs from *S. guajiro*, or which were not in my original description of *carolliae* (= *guajiro*).

DESCRIPTION

Head. Anterior division of each laterovertex with 6 setae as in *guajiro;* detached frontoclypeal plates longer than broad. *Thorax.* Chaetotaxy as in *guajiro.* FEMALE. Dorsolateral abdominal connexival setae longer than the mediodorsal ones, but not nearly as long as anterodorsal setae on lateral lobes of tergum 1+2. Tergum 7 longer than in *guajiro* and *curvatus*, usually elongate-oblong, with the sides feebly converging anteriorly, but these sometimes strongly converging as in those species. Seventh sternites very large, with 17-18 setae, these a mixture of long and shorter ones, 2-3 of them conspicuously longer macrosetae. MALE. Sternum 5 posteriorly broadly emarginate, the margin with 14-16 setae of which 11-16 are macrosetae of varying lengths, the others about half as long as the longest macrosetae and distinctly longer than the discals; sternum quite short at middle, as in *curvatus* and *guajiro*, the lateral portions usually with 2 transverse rows of setae. Sternum 7+8 with a single longer dorsolateral macroseta on each side and sometimes a short seta medial to it. Tergum 9 with 4 distolateral macrosetae, the lower one shorter, and 4-5 short setae anterior to these. Postgonites long, slender, strongly curved (Fig. 60E).

MEASUREMENTS

	Males	Females
BL	1.47-1.65	1.55-1.83
TL	0.54-0.57	0.62-0.68
WL	1.39-1.70	1.64-1.73
WW	0.68-0.75	0.72-0.80

TYPE DATA: Male holotype and female allotype ex *Anoura geoffroyi* (SVP 29349), Venezuela, T. F. Amazonas, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 27-VII-67. PARATYPES—VENEZUELA. BOLÍVAR: 1 female ex 1 *Anoura sp.* A, 85 km SSE El Dorado, Km 125, 1,032 m, 18-V-66; 1 male ex *Anoura geoffroyi*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-VI-66. T. F. AMAZONAS: 2 females ex *Anoura geoffroyi*, Cabecera del Caño Culebra, 40 km NNW Esmeralda, 1,200-1,400 m, 7-8-11-67; 2 males, same host and locality data as the holotype.

Host Associations

Strebla harderi is the first species of *Strebla* found to be associated with bats of the genus *Anoura*. The Streblinae that characteristically parasitize bats of this genus and related genera of Glossophaginae—*Lionycteris* and *Lonchophylla*—are species of the genus *Anastrebla* (q.v.).

Remarks

This species is named for Fred L. and Virginia Harder of the Venezuelan Survey field parties.

Strebla hertigi Wenzel

(Fig. 56B, 59F, 62B)

Strebla hertigi Wenzel, 1966:596, Fig. 122B, 125F, 127B

Euctenodes mirabilis, authors (part), not Waterhouse

Venezuelan Survey Records (212 males, 212 females, 7 sex undet.)

BARINAS: 2 males and 4 females ex *Phyllostomus discolor*, 2 km SW Altamira, Altamira, 611-620 m, 26-XII-67—2-I-68.

BOLÍVAR: 6 males and 4 females ex *Phyllostomus discolor*, 150 m, 8-19-VI-66; 2 males, same host, 20 km W La Paragua, Hato San José, 306 m, 10-IV-67.

CARABOBO: 20 males, 31 females and 1 sex undet. ex *Phyllostomus discolor*, 2 km SE Montalbán, Potrerito, Montalbán, 598 m, 31-X—1-XI-67; 1 male, same host, 6 km N Urama, Urama, 60 m, 17-III-66.

DTO. FEDERAL: 3 males ex *Phyllostomus discolor*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 380 m, 21-VIII-66.

FALCÓN: 3 males ex *Carollia perspicillata*, 19 km NW Urama, Km 40, Urama, 25 m, 25-X-65; 18 males, 11 females, and 1 sex undet. ex *Phyllostomus discolor*, Capatárida, 55 m, 24-25-VI-68; 2 females, same host, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-XI-67; 14 males and 14 females, same host, 80 km NW Carora, Río Socopito, 470-480 m, 20-22-V-68.

GUÁRICO: 1 male ex *Phyllostomus discolor*, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66; 3 males and 4 females, same host, 35 km SSW San Juan de los Morros, Hto. Las Palmitas, 181 m, 4-IX-66.

MIRANDA: 1 female ex *Phyllostomus discolor*, 1 km S Río Chico, 1 m, 5-XI-66; 1 female, same host, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 17-XI-66; 3 males and 3 females, same host, Birongo, 60 m, 23-I-68; 2 males and 3 females ex *Phyllostomus hastatus*, Cueva Alfredo Jahn, Birongo, 60 m, 20-I-68.

MONAGAS: 3 males and 1 female ex *Phyllostomus discolor*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68; 2 males and 1 female, same host, 5 km NW Caripe, San Agustín, 1,160-1,165 m, 28-29-VI-67.

NUEVA ESPARTA: 3 males and 2 females ex *Phyllostomus discolor*, 10 km WSW La Asunción, Isla Margarita, 47 m, 4-II-67; 1 female, same host, 3 km S La Asunción, Isla Margarita, 53 m, 16-I-67.

SUCRE: 1 female ex *Sturnira lilium*, 11 males, 7 females, and 1 sex undet. ex *Phyllostomus discolor*, 26 km ESE Carúpano, Manacal, 175-380 m, 27-VII—2-VIII-67; 9 males and 6 females, same host, 9 km NE Güiria, Ensenada Cauranta, 1-7 m, 3-16-VI-67.

T. F. AMAZONAS: 9 males and 7 females ex *Phyllostomus discolor*, 30 km S Pto. Ayacucho, Coromoto, Pto. Ayacucho, 126 m, 11-IX-67; 7 males and 8 females, same host, 33 km S Pto. Ayacucho, El Randal, Pto. Ayacucho, 195 m, 19-20-IX-67; 11 males and 9 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-14-IV-67; 16 males and 15 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 13-27-VII-67.

TRUJILLO: 1 male ex *Phyllostomus discolor*, 23 km N Valera, nr. Agua Viva, Valera, 164 m, 23-X-65; 4 males and 5 females, same host, 25 km NW Valera, nr. Agua Santa, Valera, 90 m, 7-IX—22-X-65.

ZULIA: 1 female ex *Phyllostomus hastatus*, 1 female ex *Carollia perspicillata*, 33 males, 29 females, and 1 sex undet. ex *Phyllostomus discolor*, 39 km WNW Encontrados, El Rosario, 37 m, 1-IV-66—1-IV-68; 6 males, 8 females, and 1 sex undet., same host, 45 km WNW Encontrados, El Rosario, 37 m, 31-III-68; 4 females, same host, 63 km WNW Encontrados, La Rinconada, El Rosario, 125 m, 28-II—29-IV-68; 12 males and 15 females, same host, 21 km SW Machiques, Kasmera, 270 m, 17-18-IV-68; 3 males and 10 females, same host, 33 km NW La Paz, nr. Cerro Azul, 75 m, 13-VI-68; 4 males, 3 females, and 2 sex undet. ex *Sturnira lilium*, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 19-III-68.

Host Associations

Of 431 specimens of *Strebla hertigi* collected by the survey teams, 411 (95.3 percent) were from 150 *Phyllostomus discolor*, 10 (2.3 percent) ex 2 *Sturnira lilium*, 6 (1.4 percent) ex 2 *P. hastatus* and 4 (0.9 percent) ex 2 *Carollia perspicillata*. This species commonly occurs on *P. hastatus panamensis* in Central America (Wenzel, et al., 1966:682 pp). The host of the

Venezuelan specimen recorded from *P. hastatus* from Miranda is probably that subspecies. If so, and if the association is not in error, this is the first record of *S. hertigi* from *P. hastatus hastatus*. For a discussion of the host relationships of *S. hertigi*, see Wenzel, et al., 1966:599; Wenzel and Tipton, 1966:682-687.

Strebla kohlsi Wenzel
(Fig. 57C)

Strebla kohlsi Wenzel, 1966:618, Fig. 123C

VENEZUELAN SURVEY RECORDS (4 males, 6 females)

FALCÓN: 1 male and 1 female ex 1 *Tonatia bidens*, 19 km NW Urama, Km 40, Urama, 25 m, 4-XI-65.

T. F. AMAZONAS: 1 female ex *Tonatia silvicola*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 3-I-67; 3 males and 4 females, same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V–12-VI-67.

HOST ASSOCIATIONS

The two specimens of *Strebla kohlsi* recorded (see above) from *Tonatia bidens* (SVP 5236) is probably a contaminant. The characteristic (and type) host of *S. kohlsi* is *T. silvicola*. A specimen of *T. silvicola* (SVP 5236) was collected at the same time as the specimen of *T. bidens* from which *S. kohlsi* was taken together with 16 specimens of *S. galindoi*, a characteristic parasite of *T. bidens*.

REMARKS

Two of the character states by which *Strebla kohlsi* was separated from *S. mirabilis*, i.e., the more elongate head (partially an artifact of preservation), and the longer detached frontoclypeal plates (variable) are not reliable. It is true that the female seventh sternites have fewer setae (11-12 as opposed to ± 15); but otherwise, from the relatively small amount of material available, I am unable to determine at this time whether or not *S. kohlsi* is a valid species. It may represent a partially isolated population of *S. mirabilis* that occurs on *Tonatia silvicola*.

Strebla machadoi Wenzel
(Fig. 58D, 64D)

Strebla machadoi Wenzel, 1966:607, Fig. 124D, 131B.

VENEZUELAN SURVEY RECORDS (12 males, 13 females)

APURE: 1 male ex *Micronycteris minuta*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 31-I-68.

BOLÍVAR: 1 male ex *Micronycteris minuta*, 28 km SE El Manteco, Los Patos, 150 m, 11-IV-66.

LARA: 2 males and 1 female ex *Micronycteris minuta*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 528 m, 14-VII-68.

MIRANDA: 2 males ex *Micronycteris minuta*, 7 km E Río Chico, nr. Pto. Tuy, 1 m, 5-16-XI-66; 2 females, same host, 13 km SE Caracas, nr. El Encantado, El Encantado, 570 m, 14-I-68.

MONAGAS: 1 female ex *Micronycteris minuta*, 55 km SSE Maturín, Hato Mata de Bejuco, 18 m, 3-VI-68.

SUCRE: 4 males ex *Micronycteris minuta*, 21 km E Cumaná, 1 m, 22-XII-66.

T. F. AMAZONAS: 3 females ex *Micronycteris minuta*, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-X-67.

ZULIA: 2 males and 3 females ex *Micronycteris minuta*, 33 km NW La Paz, nr. Cerro Azul, 75 m, 7-15-VI-68; 2 females, same host, 35 km NW La Paz, nr. Cerro Azul, 80 m, 11-VI-68; 1 female ex 1 *Micronycteris schmidtorum*, 40 km NW La Paz, nr. Cerro Azul, 75 m, 7-VI-68.

HOST ASSOCIATIONS

All 25 specimens of *Strebla machadoi* collected by the survey teams were from species of *Micronycteris*, 24 (96 percent) from 14 *M. minuta* and 1 ex *M. schmidtorum*. The type was from Monagas: Caripe, La Guanote, ex *M. minuta*.

Strebla matsoni, new species
(Fig. 60G, 63D)

Strebla matsoni closely resembles *S. altmani* in most characters, but in *matsoni* the anterior margin of the postvertex is more obtusely angulate (more nearly approaching that of *galindoi*) and the festoon setae of the occipital lobes are longer. The eyes in *matsoni* are larger, with eight rather than six facets, the frontoclypeal plates are more poorly defined, the longitudinal bare areas on each side of the mesosternum extend posteriorly only a little beyond mesocoxal cavities, and the male postgonites are more strongly curved.

DESCRIPTION

Head. Relatively short, ventral ante-etenidial area definitely broader than long. Frontoclypeal plates fairly large but indistinct. Eyes with 8 rather large facets. Anterior division of lateroovertices with 6 setae. Postvertex very similar to that of *altmani* but anterior angle more ob-

tuse, festoon setae of occipital lobes all distinctly longer. Setae of postvertex strong, about as long as median suture of postvertex; festoon setae of occipital lobes slender, the innermost seta a little more than half as long as those on postvertex and fairly strong, but not a spinelet; second seta minute, the third a trifle longer, the fourth longer than setae of postvertex and longer than width of margin of an occipital lobe; the sixth seta short, the seventh about as long as setae of postvertex; outermost seta very short. *Thorax.* Relatively short and broad. Mesonotal chaetotaxy as in Fig. 63D. Prescutal setae rather uniform in size and distribution, but absent from a bare area on each side medial to the epaulet setae, these 4 in number; prescutal arcs poorly defined. Longitudinal mesosternal bare areas extending posteriorly only slightly beyond mesocoxal cavities. *Legs.* Mostly without distinctive characters. Metatibiae with 2 rows of dorsal setae that are distinctly longer than the laterals, but not prominently so, those of the outer row slightly longer than those of the inner; with 2 subapical macrosetae. *Abdomen.* Dorsolateral abdominal connexival setae fairly long, distinctly longer than the lateral and ventral setae, these about as long as the shorter discal setae of sternum 2; the dorsolaterals of the females as long as the long setae of the antescutellar row, those of the males a little shorter. Sternum 2 with ± 26 discal setae, and with ± 10-12 longer setae on apical margin, 1 pair of these conspicuously longer than the others and about 3 times as long as discal setae. Female. Tergum 7 very large, roughly elongate-oval, broader than the supra-anal plate, with a very long macroseta on each side near lateral margin at about apical third, and another pair on distal margin, these about ⅔ as long as the anterior pair. Supra-anal plate with 4 distal macrosetae, lacking discal setae. Seventh sternites very short, transversely elongate, more than twice as wide as long, with ± 9 setae, mostly long, 2 or 3 of them longer than the others. Ventral arc with a small narrow lobe. Male. Sternum 5 rather small, not as wide as abdomen, very short, 2 rows of discal setae toward sides and 1 row along middle; distal margin with ± 12 long setae about 8 of these at least twice as long as sternum, 1 pair distinctly longer than the others. Sternum 7+8 with 3 dorsolateral setae on each side, the outermost one a long macroseta, the other 2 much shorter. Tergum 9 with 2 dorsolateral macrosetae and 3 macrosetae below these on distal margin, 1 or 2 of them very long; anterior to these are ± 8 short setae. Postgonites as in Fig. 60G.

Measurements

	Males	Females
BL	1.66-2.02	1.87-1.97
TL	0.62-0.75	0.66-0.70
WL	1.27-1.51	1.24-1.54
WW	0.60-0.78	0.75-0.80

Type Data: Male holotype (SVP 41654) and female allotype (SVP 41662) ex *Macrophyllum macrophyllum,* Venezuela, Zulia, 56 km WNW Encontrados, El Rosario, 76 m, 10-III-68. Paratypes—VENEZUELA. Apure: 1 female ex *Macrophyllum macrophyllum,* 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 6-XII-65. Bolívar: 1 male ex *Rhynchonycteris naso,* 4 males ex *Macrophyllum macrophyllum,* 59 km SE El Dorado, Km 74, El Manaco, 150 m, 10-24-VI-66; 1 male, same host, 50 km SE El Manteco, Río Supamo, 150 m, 11-IV-66. T. F. Amazonas: 4 males ex *Macrophyllum macrophyllum,* 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 10-II-67; 5 males and 2 females, same host, 108 km SSE Esmeralda, Río Mavaca, 140 m, 5-10-IV-67. Zulia: 1 female ex 1 *Carollia perspicillata,* 9 males, 2 females, 1 sex undet. ex *Macrophyllum macrophyllum,* 52-61 km WNW Encontrados, El Rosario, 52-76 m, 10-28-III-68.

Host Associations

Of 31 specimens collected by the survey teams, 29 were from 17 *Macrophyllum macrophyllum.* The specimens from *Rhynchonycteris naso* and *Carollia perspicillata* are probably contaminants or transitory transfers.

Interestingly, the characteristic species of *Strebla* on *Macrophyllum* in Panama (Wenzel et al., 1966:624) was *Strebla altmani,* which also occurred there on *Lonchorhina aurita.*

Strebla mirabilis (Waterhouse)
(Fig. 57A, 59E, 62A)

Euctenodes mirabilis Waterhouse, 1879:310
Euctenodes guarani Garcia and Casal, 1965:13, Fig. 4-9, *new synonym*
Strebla mirabilis, Wenzel, Tipton, and Kiewlicz, 1966:615, Fig. 123A, 125E, 134, 135A

I have examined the type of this species. The originally dry specimen, which was remounted in Canada balsam by Jobling in 1934, bears no locality data other than Colombia/79.50." Study of the type shows that the interpretation of this species by Wenzel et al. (loc. cit.) is correct.

It is clear from the illustrations of Garcia and Casal (loc. cit.) that the species described

by them as *Euctenodes guarani* from "Paraguay, sobre murciélago", is *Strebla mirabilis* Waterhouse.

VENEZUELAN SURVEY RECORDS (146 males, 93 females, 1 sex undet.)

APURE: 2 males ex *Phyllostomus elongatus*, 20 males and 14 females ex *Trachops cirrhosus*, 32 km NE Pto. Páez, La Villa, Hato Cariben, 76 m, 23-28-XII-65; 1 female, same host, 46 km NE Pto. Páez, Río Cinaruco, Hato Cariben, 76 m, 27-XII-65.

BOLÍVAR: 1 male ex *Phyllostomus elongatus*, 11 males and 3 females ex *Trachops cirrhosus*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-23-VI-66; 1 female, same host, 5 males and 3 females ex 1 *Phyllostomus hastatus*, 45 km NE Icabarú, Santa Lucia de Surukun, Icabarú, 851 m, 1-2-V-68; 1 female ex *Phyllostomus elongatus*, 70 km SSE El Dorado, Piedra Virgen, Km 125, 229 m, 29-V-66; 10 males and 16 females ex *Trachops cirrhosus*, 20 km W La Paragua, Hato San José, 306 m, 6-III–10-IV-67; 2 females, same host, 85 km SSE El Dorado, Km 125, 875 m, 9-V-66; 1 male and 1 female, same host, 50 km SE El Manteco, Río Supamo, 350 m, 11-IV-66.

CARABOBO: 1 male and 1 female ex *Trachops cirrhosus*, 6 km N Urama, Urama, 60 m, 17-III-66.

FALCÓN: 1 male ex *Artibeus jamaicensis*, 1 female ex 1 *Artibeus lituratus*, 17 males and 4 females ex *Trachops cirrhosus*, 19 km NW Urama, Km 40, Urama, 25 m, 18-28-X-65.

GUÁRICO: 3 males and 2 females ex *Trachops cirrhosus*, 14 km SE Calabozo, nr. Río Orituco, Estaction Biologica de los Llanos, 100 m, 21-22-VIII-68.

T. F. AMAZONAS: 1 male ex *Chiropterus auritus*, 2 males ex *Phyllostomus elongatus*, 37 males, 21 females, and 1 sex undet. ex *Trachops cirrhosus*, 108 km SSE Esmeralda, Río Mavaca, 140 m, 3-14-IV-67; 1 female ex *Artibeus jamaicensis*, 56 km NNW Esmeralda, Caño Culebra, Belén, 150 m, 12-I-67; 1 male ex *Chrotopterus auritus*, 12 males and 5 females ex *Trachops cirrhosus*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 5-27-VII-67; 3 females, same host, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 20-II-66; 1 male and 1 female, same host, 106 km SW Esmeralda, Brazo Casiquiare, Capibara, 130 m, 30-V–2-VI-67; 7 males and 3 females, same host, 33 km S Pto. Ayacucho, El Gavilan, Pto. Ayacucho, 135 m, 11-X-67; 1 male, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 7-IX-67; 2 males and 2 females, same host, 33 km S Pto. Ayacucho, El Raudal, Pto. Ayacucho, 195 m, 20-IX–5-X-67.

YARACUY: 4 males and 1 female ex *Trachops cirrhosus*, 11 km NW Urama, El Central, Urama, 25 m, 15-III-66.

ZULIA: 5 males and 6 females ex *Trachops cirrhosus*, 60 km WNW Encontrados, Boca del Río de Oro, El Rosario, 73 m, 17-III-68; 1 male ex 1 *Carollia perspicillata*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III-68.

OTHER VENEZUELAN MATERIAL EXAMINED

ARAGUA: 6 specimens ex *Diphylla ecaudata*, Rancho Grande, El Limón, 30-III-60, C. O. Handley, Jr.

HOST ASSOCIATIONS

Of 240 specimens of *Strebla mirabilis* collected by the survey teams, 220 (91.6 percent) were from 85 *Trachops cirrhosus*, 8 (3.3 percent ex 1 *Phyllostomus hastatus*, and 6 (2.5 percent) ex 5 *Phyllostomus elongatus*. The remaining 6 were from 6 bats of 4 species. For a discussion of the host relationships of this species, see Wenzel and Tipton (1966: 683 ff.).

REMARKS

Strebla mirabilis, *S. kohlsi*, and *S. paramirabilis* n. sp. are very similar. Specimens of *mirabilis* from *Phyllostomus hastatus*, *P. elongatus*, and *Trachops cirrhosus* appear to be the same. Statistical analyses of specimens taken from bats of these two genera in Central America has revealed no significant differences. *Strebla kohlsi*, from *Tonatia silvicola*, differs in some minor characters of chaetotaxy but otherwise is very similar to and may be a synonym of *mirabilis*. *Strebla paramirabilis*, which occurs on species of *Artibeus* and *Vampyrops* in Venezuela, is also very similar to *mirabilis*. Specimens taken from these genera of bats in Colombia are very similar to *paramirabilis*, but smaller and with fewer setae on the seventh sternites. These may represent still another species.

Strebla obtusa, new species
(Fig. 60 A, 63H)

This interesting new species is distinctive in the following combination of characters: the shape of the postvertex, the very short festoon setae of the postvertex and occipital lobes, the single elongate hyaline lens of the eye, the extraordinarily long pair of macrosetae on the seventh sternites of the female, the apically feebly curved postgonites of the male, and longer setae in single row and two macrosetae on dorsal edge of the metatibiae. In the shape of the postvertex, it superficially resembles *Strebla hertigi*, and in having a single elongate hyaline eye lens it resembles *S. tonatiae*, *S. hoogstraali*,

and S. *machadoi*. From the first two, it differs in having conspicuous detached frontoclypeal plates; from *machadoi*, which has detached frontoclypeal plates, it differs in having a very differently shaped postvertex, short festoon setae on postvertex and occipital lobes, and curved male postgonites.

Description

Head. Rather elongate, ante-ctenidial area a little longer than broad. Detached occipital plates irregularly rectangular about as long as broad. Anterior division of lateravertices with 8 setae, only the posterior ones long, the others either short or of moderate length, and stout. Eyes a single elongate hyaline lens. Postvertex as in *hertigi*, but the anterior margin a little more pointed at middle; setae of postvertex rather short, about as long as each posterior division of postvertex is wide, or a little longer. Occipital lobes with several very short spinelets on inner subdivision, the innermost one less than half as long as that on postvertex; 3 setae of the outer subdivision about as long as the postvertex setae, except the middle one which is short like the inner occipitals. *Thorax.* Chaetotaxy as in Fig. 63H. Epaulets consisting of 4 short, stout setae; prescutal arcs not well defined, their setae slightly longer than the discals; several discal setae present anterior to the arcs on each side; interval between prescutal sutures laterally with 3 transverse rows of setae. Scutum with ± 28 short discal setae and 16-17 much longer antescutellar setae. Longitudinal bare areas of mesosternum extending to about midlength of mesosternum. *Legs.* Mostly without distinctive characters. Dorsal edge of metatibiae with an outer row of setae that are longer than the others and become longer distally; with 2 very long conspicuous macrosetae, these about as long as the first 2 tarsal segments combined, 1 inserted just beyond middle, the other more distally. *Abdomen.* Sternum 2 with a broad sparsely setose area which extends anteriorly only a little beyond middle, the more posterior setae longer and stronger than the anterolateral ones; posterior margin with 15-17 longer, somewhat stouter setae, the median ones tending to be longer and usually with 1 pair of widely separated setae which are distinctly longer than the others. Female. Dorsolateral connexival setae long, especially basally and distally, most of them as long as the apical macrosetae of the supra-anal plate, and about twice as long the the ventral connexival setae, these generally as long as or longer than the longest distal setae of sternum 2. Supra-anal plate elongate-oval, with a pair of macrosetae and, posterior to them, a pair of shorter, more closely placed setae similar to a pair or more of discal setae on supra-anal plate. Seventh sternites transverse, relatively small, oboval; with about ± 12 setae, those along distal and lateral margin quite short, of about same length as ventral connexival setae, though 1 setae is about twice as long as the longest of these, and 2 are extraordinarily long, strong macrosetae which are about twice as long as width of sternites. Male. Connexival setae similar to those of the female but the ventrals about as long as the shortest discal setae on sternum 2. Sternum 5 with 3 transverse rows of distal setae similar to the ventral connexivals, sometimes with only 2 rows at middle; apical margin with 16-18 longer setae, mostly at least twice as long as discals and usually with at least 1 pair of setae that are distinctly longer than the others and longer than sternum. Sternum 6 and ventral arms of sternum 7+8 very well developed. Sternum 7+8 with a single dorsolateral macrosetae on each side. Tergum 9 on each side with 1 pair of dorsal macrosetae and 1 or 2 others along laterodistal margin; anterior to these are 6-10 short setae, and near ventral margin there is an exceptionally long macrosetae, this longer than tergum 9 viewed from below.

Measurements

	Males	Females
BL	2.02-2.22	2.20-2.39
TL	0.71-0.82	0.68-0.79
WL	1.35-1.49	1.41-1.56
WW	0.70-0.79	0.72-0.84

Type Data: Male holotype and female allotype ex *Micronycteris nicefori* (SVP 7443), Venezuela, Bolívar, 25 km SE El Manteco, Los Patos, 150-350 m, 5-IV-66. Paratypes—VENEZUELA. Bolívar: 10 males and 8 females, same data as holotype; 1 male and 1 female ex *Phyllostomus elongatus*, same locality data as the holotype but 150 m. Miranda: 1 female ex *Micronycteris nicefori*, Birongo, 60 m, 23-I-68. T. F. Amazonas: 2 males ex *Micronycteris nicefori*, 84 km SSE Esmeralda, Boca Mavaca, 138 m, 14-III-67; 2 males, same host, 25 km S Pto. Ayacucho, Paria, Pto. Ayacucho, 114 m, 19-IX-67; 1 male, same host, 108 km SSE Esmeralda, Río Mavaca, 149 m, 10-IV-67; 3 females, same host, Río Orinoco, Tamatama, 135 m, 27-IV-67.

Host Associations

Of 31 specimens of *Strebla obtusa* collected by the survey teams, 29 (93.5 percent) were

from 18 *Micronycteris nicefori*, the other 2 specimens were taken from 2 *phyllostomus elongatus*.

Strebla paramirabilis, new species
(Fig. 60C, 64F)

This species differs from *Strebla mirabilis* and *S. kohlsi* in lacking a pair of shorter discal setae on the female supra-anal plate, in the smaller number of setae (± 11 as opposed to 16-17) on each side of the male tergum 9, in having evenly curved rather than angulately bent postgonites, and in being a parasite of fruit-eating bats of the subfamily Stenodermatinae rather than of Phyllostominae.

DESCRIPTION

With the characters of *Strebla mirabilis* and *S. kohlsi* except as follows. FEMALE. Abdominal connexival setae slightly shorter than in *mirabilis*. Supra-anal plate with 4 macrosetae only, lacking a pair of shorter discal setae. Seventh sternites with 15-16 setae, mostly macrosetae of varying lengths, 2-3 of them conspicuously longer than the others. MALE. Each side of sternum 7+8 with 1 very long dorsolateral macroseta and usually a short seta medial to this. Tergum 9 with ± 11 setae on each side; 5 long macrosetae, including 2 more slender dorsomedial ones, and 3 on laterodistal margin, the most ventral seta shortest; and ± 6 short setae anterior to the lateral macrosetae. Postgonites evenly curved.

MEASUREMENTS

	Males	Females
BL	2.08-2.34	2.30-3.10
TL	0.79-0.89	0.86-0.96
WL	1.63-1.82	1.90-2.07
WW	0.83-0.92	0.85-1.02

TYPE DATA: Male holotype and female allotype ex *Artibeus jamaicensis* (SVP 16052), Venezuela, T. F. Amazonas, Cabacera del Caño Culebra, 40 km NNW Esmeralda, 1,140 m, 2-7-II-67. PARATYPES—VENEZUELA. BOLÍVAR: 3 males and 3 females ex *Vampyrops aurarius*, 1 female ex *Artibeus jamaicensis*, 85 km SSE El Dorado, Km 125, 916-1,032 m, 5-26-V-66; 1 male and 1 female, same host, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 5-7-V-68. T. F. AMAZONAS: 1 male ex 1 *Anoura geoffroyi*, 8 males and 4 females ex *Artibeus jamaicensis*, same locality data as the holotype; 4 males and 2 females ex *Vampyrops aurarius*, 2 males ex *Artibeus jamaicensis*, Caño Culebra, 50 km NNW Esmeralda, Cerro Duida, 700-800 m, 11-19-I-67; 4 females, same host, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 1-II-67. ZULIA: 1 male and 2 females ex 2 *Artibeus* sp. D, 21 km SW Machiques, Kasmera, 270 m, 15-IV-68.

HOST ASSOCIATIONS

Of 39 specimens of *Strebla paramirabilis* collected by the survey teams, 23 (60 percent) were from 11 *Artibeus jamaicensis*, 12 (31 percent) ex *Vampyrops aurarius*, 3 (7.7 percent) ex 2 *Artibeus* sp. D, and 1 ex *Anoura geoffroyi*.

Strebla proxima, new species
(Fig. 60B, 63A)

Strebla proxima is easily separated from all other species by its unusual detached frontoclypeal plates. These are unique among known species in being shaped like commas or parentheses. The long, slender, strongly curved male postgonites superficially resemble those of *harderi* but are not as long and are more strongly, downwardly curved for nearly half their length. The female tergum 7 is unique in having 3 rather long setae at apex, in addition to the more anterior pair of macrosetae.

DESCRIPTION

Head. Elongate, ventral ante-ctenidial area distinctly longer than broad. Eyes multifaceted. Postvertex variable in shape, sometimes resembling that of *machadoi* though somewhat longer and narrower anteriorly, and sometimes that of *hoogstraali*; most festoon setae stout and spine-like, those of postvertex about as long as width of postvertex; first 5 setae of posterior margin of occipital lobes are spinelets, the inner and outermost ones a little longer than the 2 between them. The next seta longer, attenuate, followed by 1 very short seta and 1 that is a little longer. *Thorax.* Chaetotaxy as in Fig. 63A. Epaulets with 4 strong setae. Preseutal arc usually consisting of 5 longer setae, each continued anteriorly by 2 additional shorter setae; interval between preseutal sutures laterally with 3 transverse rows of setae, the middle "row" with only 2 setae. Scutum with ± 34 setae and an antescutellar row of about ± 12 setae, most of them twice as long as the discals. Longitudinal bare areas on each side of mesosternum extending beyond procoxae but not reaching midlength of sternum. *Legs.* Mostly without distinctive characters. Dorsal setae of metatibiae not conspicuously longer than the others, although those of outer row do become a little longer apically; 2 slender, not very long macrosetae on apical fifth. *Abdomen.* Abdominal connexival setae short, sub-

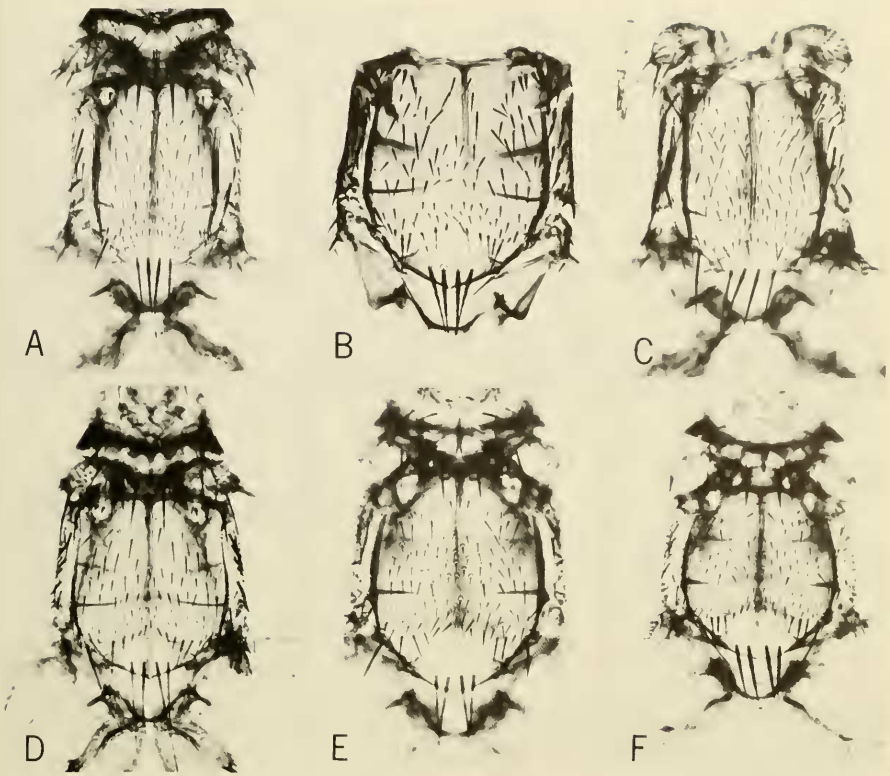

Fig. 64. Thorax, dorsal view: A. *Strebla hoogstraali* Wenzel; B, *Strebla guajiro* (Garcia and Casal); C, *Strebla tonatiae* (Kessel); D, *Strebla machadoi* Wenzel; E, *Strebla chrotopteri*, new species, female (SVP 29319); F, *Strebla paramirabilis*, new species, female (SVP 8845).

equal, mostly of about same length as discal setae of sternum 2, which has ± 27 short discal setae and ± 12 setae along posterior margin; of these, the median 4 are generally shorter, and not much longer than the discals; the others are at least two or three times as long, 1 pair usually distinctly longer than the others. Female. Tergum 7 long, somewhat lanceolate, rather evenly tapered anteriorly, with a pair of macrosetae at about apical third and on distal margin, and 3 shorter setae on distal margin, these at least ½ to ⅔ as long as the 4 distal macrosetae of supra-anal plate, which lacks discal setae (1 pair of macrosetae of supra-anal plate may be inserted anterior to the others). Seventh sternites fairly large, with ± 12 setae of varying lengths, including at least 1 pair of rather long macrosetae. Sternum 5 with ± 12 setae, the 2 median setae usually no longer than the longer discals, about 4 or 5 on each side being macrosetae, the outer ones shorter, the inner pair usually longer than the others. Sternum 7+8 with a single dorsal slender macroseta on each side. Tergum 9 with 1 pair of slender dorsolateral macrosetae on each side; distal margin with 4 or 5 setae, the most dorsal seta fairly short, the next 2-3 much longer, and the 2 ventral ones shorter; anterior to these, ventrally, are 1-3 short setae, the most posterior one longer. Postgonites very slender and strongly curved on distal half, the apical half at right angles to the long axis.

MEASUREMENTS

	Males	Females
BL	2.04-2.48	2.09-2.62
TL	0.76-0.83	0.78-0.88
WL	1.55-1.63	1.70-1.79
WW	0.69-0.83	0.74-0.85

TYPE DATA: Male holotype and female allotype ex *Peropteryx trinitatis* (SVP 1496), Venezuela, Falcón, 13 km ESE Mirimire, nr. San Pablo, 270 m, 17-XI-67. PARATYPES—VENEZUELA. FALCÓN: 1 female ex 1 *Peropteryx kappleri*, 6 km ENE Mirimire, Cerro Caridad, 260 m, 26-XI-67; 9 males and 5 females ex *Peropteryx macrotis*, 4 males and 3 females ex *Peropteryx trinitatis*, same locality data as the holotype. T. F. AMAZONAS: 2 males ex *Peropteryx macrotis*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 18-VII-67. YARACUY: 10 males and 1 female ex *Peropteryx macrotis*, 2 males ex *Peropteryx trinitatis*, 20 km NW San Felipe, Minas de Aroa, 390-400 m, 14-16-XII-67.

HOST ASSOCIATIONS

Of 39 specimens of *Strebla proxima* collected by the survey teams, all were from species of *Peropteryx*—27 (69 percent) ex 10 *P. macrotis*, 11 (28 percent) ex 4 *P. trinitatis*, and 1 ex 1 *P. kappleri*.

Strebla tonatiae (Kessel)

(Fig 64C)

Euctenodes tonatiae Kessel, 1924:411, Fig. 7-9. —Garcia and Casal, 1965:11, Fig. 1-3

Strebla tonatiae, Wenzel, Tipton, and Kiewlicz, 1966:602, Fig. 129A

VENEZUELAN SURVEY RECORDS (30 males, 28 females)

APURE: 1 male ex 1 *Sturnira lilium*, 10 males and 8 females ex *Tonatia brasiliensis*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24-135 m, 17-I—1-II-68.

BOLÍVAR: 1 male ex *Tonatia brasiliensis*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-VI-66.

FALCÓN: 1 male and 3 females ex *Tonatia brasiliensis*, 19 km NW Urama, Km 40, Urama, 25 m, 20-27-X-65.

MONAGAS: 2 males and 2 females ex *Tonatia brasiliensis*, 55 km SSE Maturín, nr. Río Tigre, Hato Mata de Bejuco, 36 m, 5-VIII-66.

T. F. AMAZONAS: 2 females ex 1 *Tonatia carrikeri*, 7 males and 9 females ex *Tonatia brasiliensis*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 24-28-VII-67; 1 male, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 8-X-67.

TRUJILLO: 5 males and 4 females ex *Tonatia brasiliensis*, 19 km N Valera, nr. Agua Viva, Valera, 164 m, 15-IX-65.

YARACUY: 1 male ex *Tonatia brasiliensis*, 11 km NW Urama, El Central, Urama, 25 m, 15-III-66.

ZULIA: 1 male ex *Tonatia brasiliensis*, 39 km WNW Encontrados, El Rosario, 37 m, 31-III-68.

HOST ASSOCIATIONS

Of 58 specimens of *Strebla tonatiae* that were collected by the survey teams, 55 (95 percent) were from the type host, *Tonatia brasiliensis*. The record from *T. carrikeri* may be in error. In sorting the specimens, I was aware that I may have mistakenly labeled a vial of *S. tonatiae* with the host number of *T. carrikeri* rather than of *T. brasiliensis*. The specimen from *Sturnira lilium* is almost certainly a contaminant.

REMARKS

I have examined the type of *Strebla tonatiae* and find it to be the species which Wenzel et al. (loc. cit., p. 602) have interpreted as that species. Garcia and Casal (loc. cit.) incorrectly figured the bare area on the mesosternum as extending to apex, but it actually extends only to about midlength. In the type, the area beyond midlength is denuded—though the sockets of the setae can be detected—so that the bare area appears to extend the entire length of the sclerite.

Strebla wiedemanni Kolenati

(Fig. 57B, 59B, 61B)

Hippobosca vespertilionis Fabricius, 1805:339. Suppressed by IZCN, 1936:29

Strebla wiedemannii Kolenati, 1856:46 (nom. nov.).—Wenzel, 1970:100.15 (emend.)

Euctenodes tupi Garcia and Casal, 1965:16, Fig. 17-22. *New synonym*

?*Euctenodes mirabilis*, Garcia and Casal, 1965: 16, Fig. 23-29, not Waterhouse 1879

Strebla vespertilionis, Wenzel, Tipton, and Kiewlicz, 1966:609, Fig. 123B, 125B, 132

I have not seen the type of *Euctenodes tupi* Garcia and Casal, nor the specimen which they recorded as *E. mirabilis* Waterhouse. It is clear from their illustrations (loc. cit.) that *E. tupi*—described from *Desmodus rotundus rotundus*, M. Alegre, Sao Paulo, Brazil—is a synonym of *Strebla wiedemanni*. Although these authors described and figured the antennal arista as "bipectinate," i.e., pectinate on both sides, this condition is unusual in *wiedemanni*. Typically, the arista is "unipectinate" as shown in their Fig. 25.

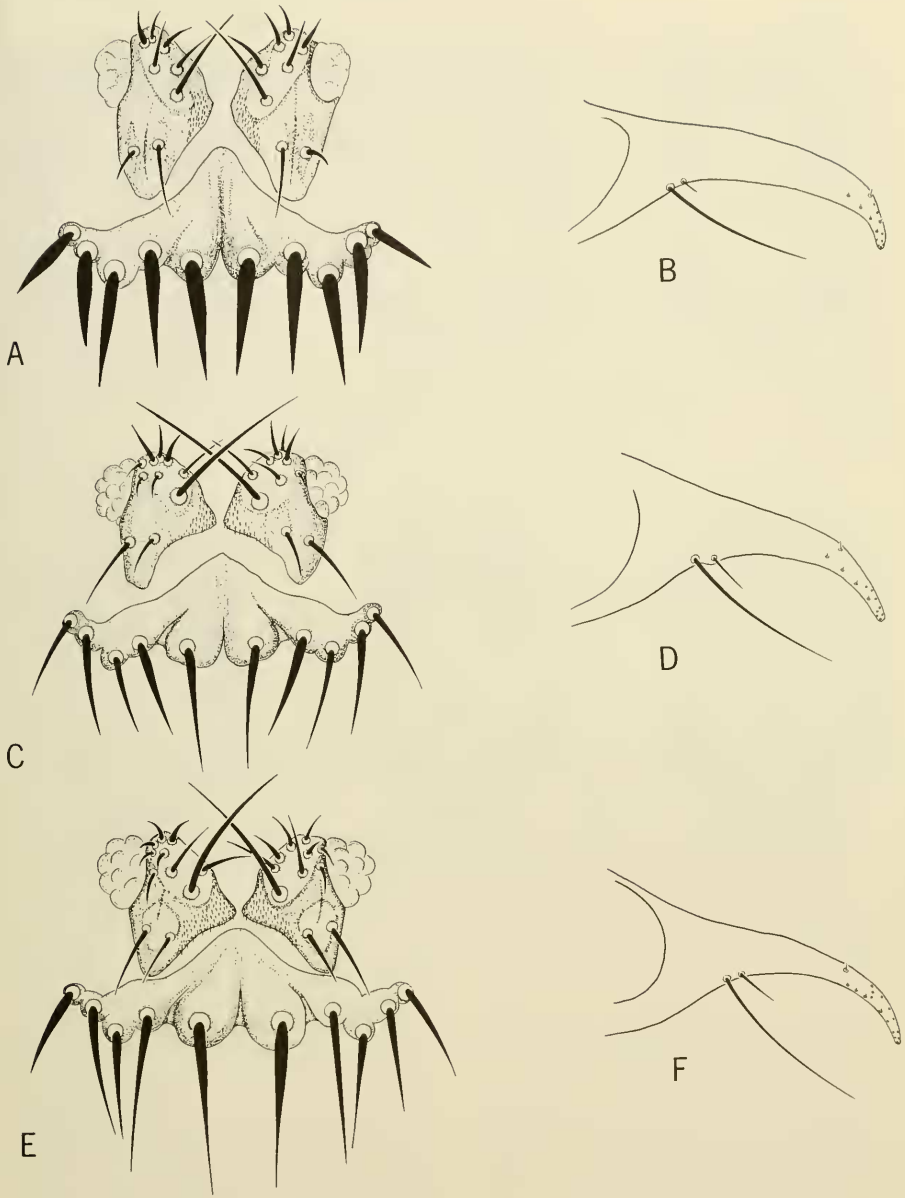

Fig. 65. Laterovertices, postvertex and occipital plates (A, C, E), postgonites (B, D, F) of: A-B, *Anastrebla nycteridis* Wenzel; C-D, *Anastrebla modestini* Wenzel; E-F, *Anastrebla mattadeni* Wenzel. From Wenzel et al. (1966).

The specimen which they recorded and figured as *E. mirabilis*—ex *Desmodus r. rotundus*, Cruz del Eje, Cordoba, Argentina—appears to be *wiedemanni*, too. The shape of the detached frontoclypeal plates, the shape of the postvertex, and the number of setae shown in the prescutal arc suggest that it could be *Strebla diphyllae*. Unfortunately, the authors neither described nor figured the chaetotaxy of the hind tibiae, which would have made it possible to fix its identity. However, *Diphylla ecaudata*, the host of *S. diphyllae*, probably does not occur in Cordoba, Argentina, and this further suggests that their specimen of "*mirabilis*" was *S. wiedemanni*. All specimens of *S. diphyllae* known to me are from Central America and Colombia (Vaupes: Río Inride, Cerro de los Pinturas). It was not taken in Venezuela by the survey teams.

VENEZUELAN SURVEY RECORDS (1,160 males, 809 females, 2 sex undet.)

This characteristic parasite of the vampire bat, *Desmodus rotundus*, occurs on that host throughout its range.

To briefly summarize, the survey teams collected this fly at 63 localities in 16 states, as follows: Apure (6 localities, 24-76 m); Barinas (3 localities, 609-1,070 m); Bolívar (2 localities, 150-306 m); Carabobo (5 localities, 25-1,537 m); Dto. Federal (1 locality, 1,507 m); Falcón (5 localities, 2-470 m); Guárico (4 localities, 100-630 m); Lara (1 locality, 580 m); Miranda (6 localities, 1-570 m); Monagas (3 localities, 18-1,180 m); Nueva Esparta (2 localities, 1-41 m); Sucre (6 localities, 1-380 m); T. F. Amazonas (9 localities, 119-155 m); Trujillo (6 localities, 90-164 m); Yaracuy (1 locality, 25 m); and Zulia (3 localities, 73-270 m).

ADDITIONAL VENEZUELAN MATERIAL EXAMINED

MONAGAS: 2 males ex *Desmodus r. rotundus*, Caripe Distr., Caripe, 24-IX-62, J. Ojasti.

HOST ASSOCIATIONS

Of 1971 specimens of *Strebla wiedemanni* collected by the survey teams, 1937 (98.3 percent) were from 442 *Desmodus rotundus*. The remaining 34 specimens were from 16 bats of 11 species.

Genus *Paraeuctenodes* Pessôa and Guimarães

Paraeuctenodes Pessôa and Guimarães, 1937:257

TYPE SPECIES: *Paraeuctenodes longipes* Pessôa and Guimarães, 1937

Except for their markedly elongate hindlegs, which lack conspicuous macrosetae, and their distinctive male postgonites, the species of *Paraeuctenodes* differ from those of *Strebla* in only relatively minor structural details.

Key to Species of *Paraeuctenodes*

1. MALE. Setae along distal margin of sternum 5 subequal, all as long as or longer than sternum. Sternum 7+8 with an oblique row of 4 short setae on each side. Postgonites strongly narrowed and distinctly curved from insertion of macrosetae to apex. FEMALE. Tergum 7 with 2 pairs of short setae ..... *similis* n. sp.

   MALE. Distal margin of sternum 5 with ± 11 setae: 1 pair much longer than sternum and separated by short setae of about same size as ventral connexivals; 2-4 that are as long as sternum; the rest short, no longer than discals. Sternum 7+8 with 1-2 short setae on each side. Postgonites little narrowed in profile, except for the very slender, downwardly curved apices. FEMALE. Tergum 7 with 1 pair short setae ..... *longipes* Pessôa and Guimarães

Paraeuctenodes longipes Pessôa and Guimarães (Fig. 66E)

Paraeuctenodes longipes Pessôa and Guimarães, 1937:258, Fig. 1-4.—Wenzel, Tipton, and Kiewlicz, 1966:627

I have examined both the holotype female and allotype male of this species. The holotype compares well with a female from *Glossophaga soricina* (SVP 9063) from Bolívar (El Manaco).

VENEZUELAN SURVEY RECORDS (18 males, 17 females)

BOLÍVAR: 2 males and 2 females ex *Glossophaga soricina*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 9-23-VI-66; 1 male and 2 females, same host, 20 km W La Paragua, Hato San José, 300 m, 4-7-IV-67; 1 male, same host, 50 km SE El Manteco, Río Supamo, 150 m, 8-IV-66.

CARABOBO: 1 female ex *Glossophaga soricina*, 6 km ENE Urama, Urama, 25 m, 6-III-66.

DTO. FEDERAL: 1 male ex *Glossophaga soricina*, nr. El Limón, 48 km W Caracas, Hda. Carapiche, 398 m, 20-VIII-66.

FALCÓN: 1 female ex *Glossophaga soricina*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 1-XII-67.

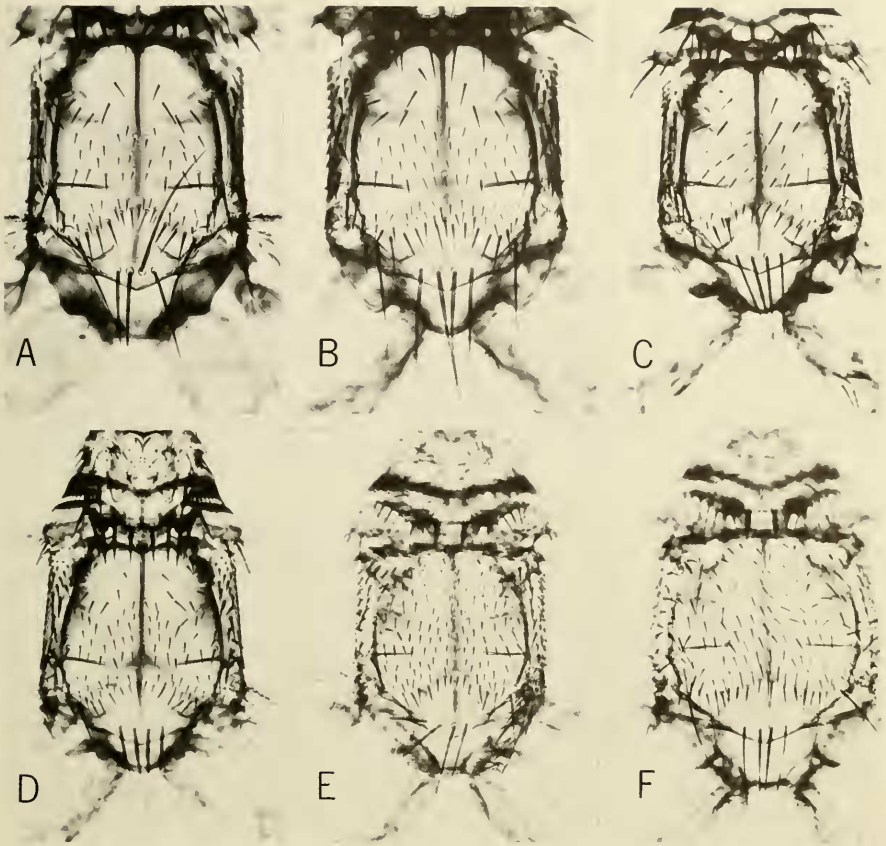

Fig. 66. Thorax, dorsal view: A, *Anastrebla modestini* Wenzel; B, *Anastrebla mattadeni* Wenzel; C, *Anastrebla caudiferae*, new species (female allotype); D, *Anastrebla spurrelli*, new species, female (SVP 43065); E. *Paraeuctenodes longipes* Pessôa and Guimarães; F, *Paraeuctenodes similis*, new species (male holotype). A-B, from Wenzel et al. (1966).

LARA: 1 male ex *Glossophaga longirostris*, 10 km N El Tocuyo, Caserio Boro, El Tocuyo, 528 m, 14-VII-68.

SUCRE: 2 males and 1 female ex *Glossophaga soricina*, 9 km NE Güiria, Ensenada Cauranta, 1-7 m, 4-16-VI-67; 1 male ex *Glossophaga longirostris*, 16 km E Cumaná, ? m, 22-XII-66.

T. F. AMAZONAS: 1 female ex 1 *Tadarida gracilis*, 1 male ex *Glossophaga soricina*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 2-13-I-67; 6 males and 4 females, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 13-20-VII-67; 1 female, same host, Río Orinoco, Tamatama, 135 m, 4-V-67.

YARACUY: 1 male ex *Glossophaga soricina*, 20 km NW San Felipe, Minas de Aroa, 400 m, 12-XII-67.

ZULIA: 1 male and 4 females ex *Glossophaga soricina*, 21 km SW Machiques, Kasmera, 270 m, 19-IV-68.

Other Venezuelan Material Examined

BOLÍVAR: 1 female ex *Artibeus lituratus*, 38 km S El Dorado, 2-VIII-62, J. Ojasti.

HOST ASSOCIATIONS

Of 35 specimens of *Paraeuctenodes longipes* that were collected by the survey team, 33 (94 percent) were from 22 *Glossophaga soricina* and 1 from *G. longirostris*. The single record from *Tadarida gracilis* is dubious. The holotype female and allotype male were reported to be from *Lonchoglossa ecaudata* and *Phyllostomus hastatus*, respectively. These records are also suspect.

Paraeuctenodes similis, new species
(Fig. 66F)

Paraeuctenodes similis is a larger and more darkly pigmented species than *P. longipes* Pessôa and Guimarães. The males are easily separated from those of *longipes* by: the oblique dorsolateral row of 4 short setae on each side of sternum 7+8; the ± 11 long marginal setae of sternum 5, all of which are as long as or longer than the sternum (only 2-4 as long as sternum in *longipes*); and by the different male postgonites. The female is distinctive in having a larger tergum 7 with 2 pairs of short discal setae rather than 1.

DESCRIPTION

Generally with the characters of *longipes* but larger and more deeply pigmented. *Head.* Setae of posterovertex and occiput generally a little longer and stronger than in *longipes*. Eyes with 7 facets. *Thorax.* Prescutum similar to that of *longipes* in chaetotaxy and structure, but with the anterior pigmented suture usually much more distinct. Scutum with longer, more uniform antescutellar setae than *longipes*. *Abdomen.* Sternum 2 with ± 30 discal setae, and ± 11-12 marginals, all but 1 pair of widely separated macrosetae slightly longer than the discals, the macrosetae about twice as long as the other marginals. Dorsolateral and lateral connexival setae subequal, much shorter than the medioventrals, which are about twice as long as discals of sternum 2 but not as strong. FEMALE. Tergum 7 subrotund, longer than broad, with 2 pairs of short distal setae, the anterior pair longer and more widely separated. Supra-anal plate with 4 distal macrosetae. Seventh sternites small, nearly round, with 4-5 setae including 3 macrosetae, 2 of these longer than the other. MALE. Sternum 5 well defined, with 11 marginal setae, all of them as long as or longer than the sternum; discs occur laterally, with setae arranged in 3 transverse rows. Sternum 7+8 on each side with an oblique row of 4 short dorsolateral setae. Tergum 9 with 5 distal macrosetae, the dorsolateral one distant from the others, 2 shorter setae ventrally, and 2 short setae anterior to them. Postgonites with macrosetae inserted near base, strongly narrowed and curved from insertion of macrosetae to apex.

MEASUREMENTS

	Males	Females
BL	2.40-2.68	2.57
TL	0.86-0.99	1.05
WL	1.90-2.02	2.42
WW	0.88-0.98	1.11

TYPE DATA: Male holotype ex *Carollia perspicillata* (SVP 43206), Venezuela, Bolívar, 13 km NE Icabarú, Icabarú, 881 m, 8-V-68. PARATYPES—VENEZUELA. BOLÍVAR: 1 male ex *Carollia perspicillata*, 85 km SSE El Dorado, Km 125, 916 m, 13-V-66. COLOMBIA. SANTANDER: 1 female ex *Carollia perspicillata* (CJM 5889), San Joaquin, 24-IX-66. BRAZIL. SAO PAULO: 1 male ex *Trachops cirrhosus* (FMNH 94726), Primeiro Morro, 4-VII-61, A. M. Olalla.

Genus *Anastrebla* Wenzel

Anastrebla Wenzel, 1966:627

TYPE SPECIES: *Anastrebla modestini* Wenzel, 1966:629

Strebla, authors, not Wiedemann

This genus is distinctive not only in the characters given in the key to genera (see above) but in others which were not noted in my (Wenzel, 1966:628) diagnosis of the genus. Chief among these is the structure of the anterior angles of the thorax.

In *Strebla*, as in many of the Streblidae, the notopleural sutures are membranous for most of their length, then bend outwardly on each side as closed sutures and extend to the spiracles behind anterior margin. Thus, the upper portion of each mesepisternum extends nearly to the anterior angles, its anterior portion lateral to the anterior angles of the prescutum. There are only moderate emarginations on the anterior face of thorax to accommodate the dorsal lobes of the procoxae. In *Anastrebla*, however, the closed portion of the notopleural sutures continue anteriorly without bending laterally, and each bends downward along the floor of a pronounced fossa formed by an excavation of the prescutum, the inner anterior portion of the mesepisternum, and the procpisternum. Thus, the anterior angles of the thorax are preempted by the rather broad anterodorsal portions of the mesepisterna, which are twice as wide anteriorly as posteriorly and studded with short, thorn-

like setae which become larger posteriorly. The epaulet setae are inserted on each side in a longitudinal rather than horizontal row on a short raised longitudinal protuberance, which is bounded by the "coxal fossa" on one side and by another shorter, less prominent groove on its medial margin. The anterior margin of the thorax is incised by these two grooves—which appear to accommodate part of the occipital lobes and several of their setae—and thus the medial portion of the anterior margin is set off as a short, broad projection. In *Anastrebla nycteridis* Wenzel, *A. caudiferae* n. sp. and *A. spurrelli* n. sp., the lateral angles of this projection almost invariably bear 2 short stout setae and in *mattadeni* and *modestini* only 1. Sternum 5 is "absent" in males of *Anastrebla*, though in *A. nycteridis* they appear to be represented by 2 transverse, feebly sclerotized strips which are hardly longer than the width of a setal socket.

Key to the Species of *Anastrebla*

1. Eyes raspberrylike, noticeably bulging beyond lateral margins of lateravertices; facets distinct. Posterior lobes of lateravertices shorter, postvertex not as strongly produced anteriorly. Median projection of anterior margin of prescutum with a single short, coarse seta in each lateral angle (if, rarely, 2 are present, the second one is inserted behind the other and usually is much weaker) 2

   Eyes wider anteriorly than posteriorly, scarcely projecting beyond—their outer margins nearly straight and parallel with—the lateral margins of the lateravertices; facets may be partially fused. Posterior lobes of lateravertices longer, the anterior median projection of the postvertex strongly produced between them. Median projection of anterior margin prescutum with 2 short, stout setae, side by side, in each lateral angle 4

2. First longitudinal vein bare dorsally, or with only a few setae distally 3

   First longitudinal vein essentially setose throughout its length, bare for only a very short distance basally. Other veins setose throughout, excepting a short area at base of *rs* and sixth longitudinal vein ..... *mattadeni* Wenzel

3. Longitudinal veins generally setose throughout, excepting: vein 1, with distal setae only; *rs*, setae lacking basally; vein 6, variable, sometimes setose throughout excepting a short basal area, or with distal setae only. Tergum 7 longer, a pair of short setae inserted posterior to the macrosetae ..... *modestini* Wenzel

   Wing veins very irregularly setose: vein 1 with 1-6 setae distally; *rs* with several distal setae; vein 2 usually bare on ⅓ to basal ½, sometimes with scattered setae throughout length; vein 3 bare on basal ½ to ⅔; vein 4 with 1-3 setae before crossvein 1, and 2-3 more setae before and 1-2 beyond crossvein 2; vein 5 with ± 6 setae basally, then bare to near crossvein 2, sometimes with scattered setae between crossveins 2 and 3; vein 6 completely bare. Female. Tergum 7 shorter oval-transverse, with a pair of short setae inserted between the pair of macrosetae ..... *caudiferae* n. sp.

4. First longitudinal wing vein lacking setae on about distal half of length. Male. Postgonites strongly, evenly curved (Fig. 601). Female. Tergum 7 with a pair of macrosetae, but lacking a pair of small setae ..... *spurrelli* n. sp.

   First longitudinal vein setose throughout its length. Male. Postgonites less curved, except at apex (Fig. 65B). Female. Tergum 7 with a pair of macrosetae and a pair of short setae slightly posterior and medial to them ..... *nycteridis* Wenzel

Anastrebla modestini Wenzel

(Fig. 65C-D, 66A)

Anastrebla modestini Wenzel, 1966:629, Fig. 138A, 139C-D

Venezuelan Survey Records (43 males, 26 females, 1 sex undet.)

BARINAS: 1 male ex *Anoura geoffroyi*, 2 km SW Altamira, Altamira, 609 m, 3-I-68; 1 male, same host, Altamira, 794 m, 20-XII-67.

BOLÍVAR: 1 male and 1 female ex *Anoura* sp. A, 1 male and 2 females ex *Anoura geoffroyi*, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 13-23-VI-66; 6 males, 6 females, and 1 sex undet., same host, 2 males and 2 females ex *Anoura* sp. A, 85 km SSE El Dorado, Km 125, 1,032-1,165 m, 10-26-V-66; 1 male ex *Anoura geoffroyi*, 20 km W La Paragua, Hato San José, 300 m, 8-IV-67; 1 male, same host, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 7-V-68.

CARABOBO: 1 female ex *Anoura* sp. A, 1 male and 1 female ex *Anoura geoffroyi*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 27-30-XI-67; 1 male and 1 female, same host, 2 km SE Montalbán, Potrerito, Montalbán, 598 m, 1-XI-67.

DTO. FEDERAL: 2 males ex *Anoura* sp. A, 5 km NNE Caracas, nr. Hotel Humboldt, Pico Ávila, 2,240 m, 31-VIII-65.

FALCÓN: 1 male ex 1 *Carollia perspicillata*, 3 males and 5 females ex *Anoura geoffroyi*, 16 km ENE Mirimire, nr. La Pastora, 70 m, 28-XI—1-XII-67; 3 males and 1 female, same host, 14 km ENE Mirimire, nr. La Pastora, 60-122 m, 21-27-XI-67.

GUÁRICO: 1 female ex *Anoura geoffroyi*, 10 km NE Altagracia, Hda. Elvira, 630 m, 16-IX-66.

MÉRIDA: 1 male and 1 female ex *Anoura geoffroyi*, 12 km SE La Azulita, La Carbonera, 2,190 m, 21-IV-66; 1 male, same host, 6 km ESE Tabay, Middle Refugio, Tabay, 2,550 m, 15-IV-66.

MIRANDA: 1 male ex *Anoura geoffroyi*, Birongo, 60 m, 22-I-68; 1 male and 1 female, same host, 5 km NNW Guarenas, Curupao, 1,160-1,180 m, 6-14-X-66.

MONAGAS: 1 female ex *Anoura geoffroyi*, 3 km NW Caripe, nr. San Agustín, 1,170 m, 1-VII-67; 3 males, same host, 5 km NW Caripe, San Agustín, 1,150-1,165 m, 27-VI—3-VII-67.

SUCRE: 2 males ex *Anoura geoffroyi*, 9 km NE Güiria, Ensenada Cauranta, 7 m, 15-16-VI-67; 1 male ex *Anoura* sp. A, 26 km ESE Carúpano, Manacal, 366 m, 19-VII-67.

T. F. AMAZONAS: 2 males ex *Anoura* sp. A, 3 males ex *Anoura geoffroyi*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 24-27-VII-67; 2 males and 1 female, same host, Cabecera del Caño Culebra, 40 km NNW Esmeralda, 1,400 m, 8-II-67; 1 female, same host, 30 km S Pto. Ayacucho, Platanilla, Pto. Ayacucho, 119 m, 13-X-67; 1 male, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 8-X-67.

Remarks

Variation in chaetotaxy of the sixth longitudinal wing vein in *modestini* is both interesting and puzzling. In Panamanian specimens this vein typically has 1-3 setae proximal to—and 1 or more just beyond—midlength, and several near third crossvein. Most Venezuelan specimens from *Anoura geoffroyi* fall into two distinct classes as regards the number of setae on vein 6, those with 1-8 (more commonly 1-5) setae, and those with 12-20. Most of those with 1-5 setae were taken at elevations above 366 meters, but the same was generally true of the hosts. However, approximately 50 percent of those flies with 1-5 setae were taken together with *Exastinion deceptivum* n. sp. (see above), but only one with *E. clovisi*. Specimens from Colombia were also taken together with *E. deceptivum*, from *A. geoffroyi peruana*. Pending further analysis and identification of the host bats to subspecies, the data suggest that the host specimens represent more than one subspecies (or species?) and that altitudinal differences are involved. While the differences in chaetotaxy may simply reflect different developmental responses to environmental variables, the strong correlation that exists between the distribution of *E. deceptivum* and those of *Anastrebla modestini* that have reduced setation on vein 6 suggests a more complex situation. Those specimens of *modestini* taken from *Anoura* "sp. A" exhibit essentially the same setal differences as do those from *A. geoffroyi*. No specimens of *E. deceptivum* were taken from *Anoura* sp. A.

Anastrebla mattadeni Wenzel
(Fig. 65E-F, 66B)

Anastrebla mattadeni Wenzel, 1966:631, Fig. 138B, 139E, F

Venezuelan Survey Records (1 male ex 1 *Anoura cultrata*)

MIRANDA: 1 male, 4 km SW Birongo, Cueva Walter Dupouy, Birongo, 195 m, 28-I-68.

Remarks

This species was described from Panama and Venezuela (Rancho Grande Biological Station) chiefly from *Anoura cultrata*, which appears to be its characteristic host. Because of a mislabeled vial, I (Wenzel, loc. cit.) mistakenly recorded some of the Venezuela paratypes as being from *A. aculeata*, thereby inadvertently creating a *nomen nudum*. There is no species of *Anoura* by that name.

Anastrebla caudiferae, new species
(Fig. 60J, 66C)

Strebla vespertilionis Fabricus of Speiser, 1900: 38, Pl. 4, Fig. 1, 2

Anastrebla caudiferae is clearly the species which Speiser (loc. cit.) recorded from *Lonchoglossa ecaudata* (= *Anoura caudifera*). It is nearly identical to *A. modestini* and *A. mattadeni* in structure of the head, including eyes

and shape of the postvertex, but the festoon setae of the postvertex and occipital lobes are generally slightly coarser. The female differs in that tergum 7 is transversely oval and the pair of short setae are inserted medial to rather than behind the macrosetae, the 4 arranged in a transverse row.

Description

Head. Eyes and shape of postvertex as in *A. modestini* and *A. mattadeni*, but festoon setae usually slightly coarser than in those species. *Thorax.* Epaulets consisting of 4 setae, 2 of them usually coarser and longer and 2 shorter and finer, sometimes 3-1; each lateral angle of median presetal projection usually with only 1 coarse seta, occasionally 2 and even 3, but the extra ones are usually smaller and lie behind rather than next to the strong seta; presetal arcs with 3-5 setae (mean, 4); with 18-33 (mean, 22.5) discal setae, and 4-6 setae basally along each lateral margin. Scutum with 28-47 (mean, 37) setae. *Wings.* Setation (excluding macrosetae) as follows: first longitudinal vein largely bare, with 1-6 setae near apex; *rs* with 1-3 distal setae; second vein usually bare on basal ⅓ to ½, sometimes with scattered setae over entire length; third vein bare on basal ½ or ⅔; fourth vein with 1-3 setae near first crossvein, 2-3 near second crossvein, and 1-2 beyond; fifth vein with ± 6 basally, then bare to near second crossvein, sometimes with scattered setae between second and third crossveins; sixth vein completely bare. *Abdomen.* Dorsolateral and lateral abdominal connexival setae minute, those of venter about twice as long and nearly as long as, but much weaker than, shorter discal setae of sternum 2; much longer segmentally arranged paired setae present as usual, also an apical transverse row of much longer setae in both sexes. Sternum 2 with 14-19 setae on apical margin (mean, 16.5), and 22-31 (mean, 25) on disc. Female. Tergum 7 oval-transverse, with 2 short setae placed medial to and on a line with the 2 macrosetae. Supra-anal plate with 4 long, slender distal setae and a pair of short discal setae anterior to these. Seventh sternites with 8-11 setae of varying lengths including ± 4 distinctly longer macrosetae. Male. Sternum 6 well developed. Sternum 7+8 with 3-5 setae, 3 of them conspicuous macrosetae. Tergum 9 with 7-11 setae in 2 rows, usually an anterior row of about 3 very long macrosetae and 1 or 2 shorter, more ventral setae and a laterodistal row of more slender setae of varying lengths, none as long as the longer macrosetae of anterior row. Postgonites as in Fig. 60J.

Measurements

	Males	Females
BL	1.92-2.14	2.15-2.36
TL	0.68-0.78	0.67-0.78
WL	1.90-2.11	1.88-2.16
WW	0.71-0.80	0.72-0.82

Type Data: Male holotype and female allotype ex *Anoura caudifer* (SVP 10512), Venezuela, Miranda, 5 km NNW Guarenas, Curupao, 1,140 m, 13-X-66. Paratypes—Barinas: 1 female ex Anoura caudifer, Altamira, 620 m, 26-XII-67; 3 males, 3 females, 1 sex undet., same host, 2 km SW Altamira, Altamira, 611-620 m, 28-XII-67—1-I-68. Bolívar: 4 males and 3 females ex *Anoura caudifer*, 85 km SSE El Dorado, Km 125, 826-1,165 m, 16-23-V-66. Carabobo: 3 males ex *Anoura caudifer*, 4 km NW Montalbán, La Copa, Montalbán, 1,537 m, 29-30-XI-67. Dto. Federal: 2 males ex *Anoura caudifer*, 4 km NNW Caracas, Los Venados, 1,498 m, 23-VII-65. Miranda: 8 males and 6 females, same data as the holotype but 1,180 m, 13-14-X-66; 1 female, same host, 16 km SSE Caracas, San Andres, 950 m, 30-XII-65. T. F. Amazonas: 1 male ex *Anoura caudifer*, Caño Culebra, 50 km NNW Esmeralda, Cerro Duida, 700 m, 17-I-67.

Anastrebla nycteridis Wenzel
(Fig. 65A, B)

Anastrebla nycteridis Wenzel, 1966:629, Fig. 139A-B

Until now, *Anastrebla nycteridis* Wenzel was known only from the holotype male. Except for a marked difference in size, the slightly shorter ventral abdominal connexival setae, and the presence of a pair of short setae in addition to the macrosetae on tergum 7, the female of *nycteridis* is remarkably similar to that of *A. spurrelli* n. sp. Both sexes of *nycteridis* are more darkly pigmented, have more numerous prescutal discal setae behind the arc, ranging in number from 43-63 (mean, 62) and a slightly larger number (43-44) of scutal setae, and have the first longitudinal vein setose for its entire length.

Measurements

	Males	Females
BL	2.24	2.56-2.81
TL	0.76-0.83	0.87-0.96
WL	2.06-2.21	2.20-2.32
WW	0.76-0.84	0.87-0.98

Venezuelan Survey Records (8 males and 9 females ex 11 *Lonchophylla robusta*)

BARINAS: 4 males and 1 female, 2 km SW Altamira, Altamira, 609-620 m, 26-XII-67–4-I-68; 1 male and 1 female, 7 km NNE Altamira, Altamira, 1,070 m, 25-XII-67; 2 males and 3 females, Altamira, 794 m, 21-XII-67–10-I-68.

ZULIA: 1 female, 21 km SW Machiques, Kasmera, 270 m, 19-IV-68; 1 male and 3 females, 19 km WSW Machiques, Novito, 1,135 m, 2-V-68.

HOST ASSOCIATIONS

All known specimens of *Anastrebla nycteridis* are from *Lonchophylla robusta*.

Anastrebla spurrelli, new species
(Fig. 60I, 66D)

Anastrebla spurrelli closely resembles *A. nycteridis* but differs in its distinctly smaller size, more distinct eye facets (none partially fused), the absence of a pair of short setae in addition to macrosetae on female tergum 7, and the strongly, evenly curved male postgonites. Except for these, most characteristics of *A. nycteridis* apply to *spurrelli* as well, and the following description chiefly emphasizes differences or character states not mentioned in the original description of *nycteridis*.

DESCRIPTION

Head. Essentially identical to that of *nycteridis*, but all eye facets distinct. Anterior projection of postvertex generally slightly broader. *Thorax.* With 4 epaulet setae, 3 of them coarser and 1 shorter and finer. Prescutum 5-6 setae on each side in prescutal arc, and posterior to these 34-50 (mean, 44) discal setae and 5-6 setae along each basolateral margin. Scutum with 22-39 shorter setae (mean, 26) and 19-24 intermediate or long antescutellar setae (mean, 22). *Wings.* First longitudinal vein bare on about distal half, the others essentially setose throughout. *Abdomen.* Dorsolateral and lateral connexival setae minute, the ventral setae about twice as long, slightly longer than in *nycteridis*. Sternum 2 with 13-16 (mean, 14.6) marginal and 21-30 (mean, 25) discal setae. FEMALE. Tergum 7 with anterior portion suborbicular, a macroseta inserted on each side at widest portion; united to supra-anal plate by a narrower posterior strap. Supra-anal plate with the usual 4 distal macrosetae and a pair of short discal setae anterior to these. Seventh sternites with 10-12 setae of varying lengths, none very short, several distinctly longer macrosetae. MALE. Sternum 5 not visible, but a row of 8-9 long setae apparently represent the setae of the apical margin of that sternum. Sternum 6 well developed. Sternum 7+8 with 3-6 (usually 4) setae on each side, including 3 very long macrosetae. Tergum 9 with 9-12 setae arranged in 2 rows, an anterior row usually of 5-6, the 4 more dorsal ones very long macrosetae, the ventral ones much shorter—and a distal row, of which several are macrosetae, but shorter than those of anterior row. Postgonites strongly, evenly curved, their distal half nearly at right angles to the long axis.

MEASUREMENTS

	Males	Females
BL	1.89-2.12	1.87-2.52
TL	0.66-0.70	0.70-0.78
WL	1.56-1.77	1.79-1.94
WW	0.60-0.77	0.75-0.83

TYPE DATA: Male holotype and female allotype ex *Lionycteris spurrelli* (SVP 9270), Venezuela, Bolívar, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 8-25-VI-66. PARATYPES—BOLÍVAR: 1 male ex 1 *Ametrida centurio*, 4 males and 1 female ex *Lionycteris spurrelli*, 85 km SSE El Dorado, Km 125, 1,014-1,032 m, 10-19-V-66; 12 males and 3 females, same data as the holotype; 2 females ex *Lionycteris spurrelli*, 11 km NE Icabarú, Icabarú, 750 m, 9-V-68; 1 male and 1 female, same host, 13 km NE Icabarú, Icabarú, 817 m, 8-V-68; 1 male, same host, 19 km NE Icabarú, Icabarú, 700 m, 6-V-68; 9 males and 7 females, same host, 21 km NE Icabarú, El Pauji, Icabarú, 851 m, 6-V-66–8-V-68. T. F. AMAZONAS: 1 male ex *Lionycteris spurrelli*, 56 km NNW Esmeralda, Río Cunucunuma, Belén, 150 m, 1-I-67; 1 male, same host, Cabecera del Caño Culebra, 40 km NNW Esmeralda, 1,400 m, 6-II-67; 1 male, same host, 32 km S Pto. Ayacucho, Raya, Pto. Ayacucho, 135 m, 12-IX-67; 1 male, same host, 65 km SSW Pto. Ayacucho, nr. Morganito, Pto. Ayacucho, 161 m, 4-X-67; 4 males, same host, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 25-VII-67.

HOST ASSOCIATIONS

Of 52 specimens of *Anastrebla spurrelli* collected by the survey teams, all but one were from *Lionycteris spurrelli*. The single specimen from *Ametrida centurio* is probably a contaminant or a transitory transfer.

Genus *Metelasmus* Coquillett

Metelasmus Coquillett, 1907:292

TYPE SPECIES: *Metelasmus pseudopterus* Coquillett, 1907:292

Lemosia Pessôa and Galvão, 1936:243
Type Species: *Lemosia setosa* Pessôa and Galvão, 1936:244

Metelasmus sp.

An interesting new species of *Metelasmus* was collected from *Sturnira ludovici* by the survey teams. Among other characters, it is distinctive in having very small detached frontoclypeal plates, long slender festoon setae on the posterior margin of postvertex and occipital plates, reduced mesonotal chaetotaxy, longer wings, and longer abdominal connexival setae. However, I hesitate to describe the species from these specimens because the apical half of the abdomen is missing in one and badly damaged in the other. Nonetheless, I call attention to the fact that *Metelasmus* is not a monotypic genus.

Venezuelan Survey Records (1 male and 1 sex undet.)

BARINAS: 1 male ex *Sturnira ludovici*, 2 km SW Altamira, Altamira, 611 m, I-1-68; 1 sex undet., same host, 794 m, 21-XII-67.

Metelasmus pseudopterus Coquillett
(Fig. 2A-B, 67)

Metelasmus pseudopterus Coquillett, 1907:292, Fig.—Wenzel, Tipton, and Kiewliez, 1966:634, Fig. 140
Lemosia setosa Pessôa and Galvão, 1936:244, Fig. 1-4

Venezuelan Survey Records (139 males, 88 females, 1 sex undet.)

To briefly summarize, the survey team collected 128 males, 85 females, and 1 sex undet. from 138 *Artibeus jamaicensis*. These specimens were collected at 44 localities in 15 states, as follows: Apure (1 locality, 24 m); Barinas (2 localities, 609-794 m); Bolívar (3 localities, 150-775 m): Carabobo (4 localities, 598-1,537 m); Dto. Federal (2 localities, 398-1,465 m); Falcón (6 localities, 2-480 m); Guárico (2 localities, 470-630 m); Lara (1 locality, 528 m); Miranda (4 localities, 60-1,160 m); Monagas (1 locality, 1,160-1,165 m); Sucre (3 localities, 1-90 m); T. F. Amazonas (3 localities, 138-155 m); Trujillo (4 localities, 90-164 m); Yaracuy (1 locality, 395 m); Zulia (7 localities, 24-1,135 m). Specimens collected from other hosts are as follows:

APURE: 1 male and 1 female ex *Artibeus lituratus*, 29 km SSW Santo Domingo, Selvas de San Camilo, Nulita, 24 m, 25-I–5-II-68.

BOLÍVAR: 1 male and 1 female ex 1 *Artibeus* sp. A, 59 km SE El Dorado, Km 74, El Manaco, 150 m, 20-VI-66.

MONAGAS: 1 male ex 1 *Myotis nigricans*, 3 km NW Caripe, nr. San Agustín, 1,190 m, 3-VII-67.

SUCRE: 1 male ex *Artibeus lituratus*, 11 km NE Güiria, Ensenada Cauranta, 75 m, 10-VI-67.

T. F. AMAZONAS: 1 male ex 1 *Peropteryx macrotis*, Río Orinoco, Esmeralda, 135 m, 11-V-67; 3 males and 1 female ex 4 *Phyllostomus hastatus*, 1 male ex 1 *Uroderma magnirostrum*, 163 km ESE Pto. Ayacucho, Río Manapiare, San Juan, 155 m, 13-27-VII-67.

YARACUY: 1 male ex 1 *Chiroderma villosum*, 20 km NW San Felipe, Minas de Aroa, 395 m, 22-XII-67.

ZULIA: 1 male ex 1 *Phyllostomus discolor*, 33 km NW La Paz, nr. Cerro Azul, 75 m, 13-VI-68.

Other Venezuelan Material Examined

MIRANDA: 1 male ex *Artibeus jamaicensis*, El Cafetal, 8-IV-62, J. Ojasti.

Host Associations

Of 277 specimens of *Metelasmus pseudopterus* collected by the survey teams, 214 (97 percent) were from *Artibeus jamaicensis*. Although the above records, and others, clearly show that this fly is a characteristic parasite of that host, they also suggest that *M. pseudopterus* may occasionally be a facultative parasite of other fruit bats. The records from other hosts probably represent contaminants or temporary associations.

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Study of this extensive material would not have been possible without the invaluable help of many people, including especially the principal investigators of the Smithsonian Venezuelan Project: Drs. Charles O. Handley, Jr., and Vernon J. Tipton; the field survey teams (see above); Dennis Derda, Helen Wooden, Delores Rayford, and Darryl Troupe, who were responsible for identifying, sorting, and labeling collections; my son, Stephen, who coded the data and measured the specimens; Kay Ferris, Kim Mortensen, and Jane Ailes, of Dr. Handley's project staff, who were responsible for handling and processing the data; and my wife, Mary, and

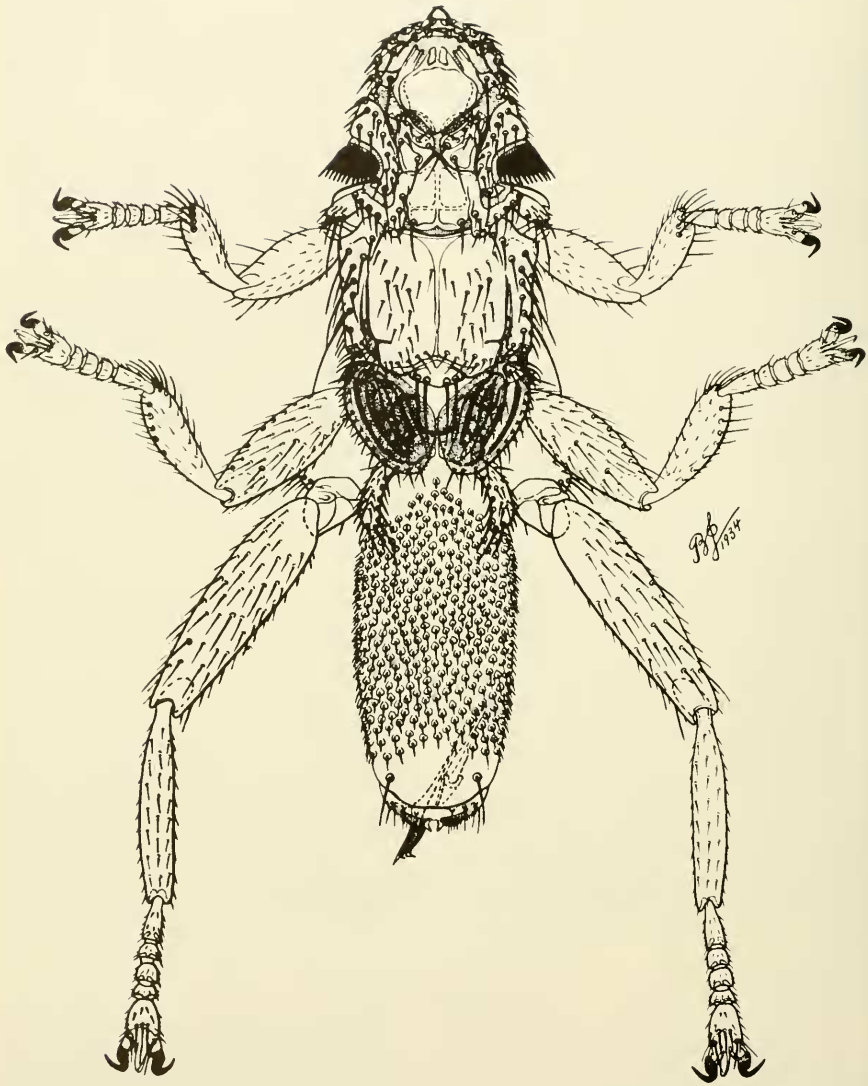

Fig. 67. *Metelasmus pseudopterus* Coquillett, male: dorsal view. From Jobling (1936).

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I am very grateful to Dr. B. Jobling, now retired, formerly of the Wellcome Laboratories of Tropieal Medicine, London, for his generosity some years ago in providing copies of illustrations from his various papers. These were reproduced in Wenzel et al. (1966) and are used again in this report. All new illustrations were made by me and the line drawings inked by Marion Pahl. All but one of the new illustrations of male postgonites, unless otherwise indicated in the legends, were made to the same scale. Photo illustrations vary greatly in scale.

Above all, I am indebted to my secretary, Patricia Peyton Johnson, who expertly prepared the initial data cards, entered, organized, and kept up-to-date all of the identifications and necessary cross files, checked and collated the great mass of data for the manuscript, typed most of it, and read proofs. Without her help this work could not have been completed.

HOST-PARASITE LIST

Higher taxa as well as species arranged alphabetically
° = not a characteristic parasite of this host (contaminants and/or temporary or occasional parasites)

Order CHIROPTERA

Superfamily Emballonuroidea

Family *Emballonuridae*

Cormura brevirostris
- *Strebla cormurae*, n. sp.

Peropteryx kappleri
- *Strebla proxima*, n. sp.
- *Trichobius longipilis*, n. sp.

Peropteryx macrotis
- °*Exastinion clovisi* (Pessôa & Guimarães)
- °*Metelasmus pseudopterus* (Coquillett)
- *Strebla proxima*, n. sp.
- *Trichobius longipilis*, n. sp.

Peropteryx trinitatis
- *Strebla proxima*, n. sp.

Saccopteryx bilineata
- °*Noctiliostrebla aitkeni* Wenzel
- *Strebla asternalis*, n. sp.
- °*Trichobius parasiticus* Gervais

Saccopteryx sp.
- *Strebla asternalis*, n. sp.

Rhynchonycteris naso
- °*Strebla hirsutus*, n. sp.
- °*Trichobius caecus* Edwards
- °*Trichobius longipes* (Rudow)

Family *Noctilionidae*

Noctilio labialis
- *Noctiliostrebla maai* Wenzel
- °*Noctiliostrebla traubi* Wenzel
- *Paradyschiria curvata*, n. sp.
- °*Paradyschiria lineata* Kessel
- *Paradyschiria parvula* Falcoz
- *Paradyschiria parvuloides* Wenzel
- °*Strebla curvata*, n. sp.
- °*Trichobius johnsonae* Wenzel
- °*Trichobius parasiticus* Gervais
- *Xenotrichobius noctilionis*, n. g., n. sp.

Noctilio leporinus
- °*Megistopoda aranea* (Coquillett)
- °*Megistopoda* sp.
- *Noctiliostrebla aitkeni* Wenzel
- *Noctiliostrebla dubia* (Rudow)
- °*Noctiliostrebla maai* Wenzel
- *Noctiliostrebla traubi* Wenzel
- *Paradyschiria lineata* Kessel
- °*Trichobius joblingi* Wenzel
- °*Trichobius parasiticus* Gervais
- *Xenotrichobius noctilionis*, n. g., n. sp.

Superfamily Phyllostomoidea

Family *Mormoopidae*

Mormoops megalophylla
- *Nycterophilia coxata* Ferris
- *Nycterophilia fairchildi* Wenzel
- *Nycterophilia mormoopsis*, n. sp.
- °*Trichobius caecus* Edwards
- *Trichobius leionotus*, n. sp.
- °*Trichobius parasiticus* Gervais

Pteronotus davyi
- *Nycterophilia coxata* Ferris
- *Nycterophilia fairchildi* Wenzel
- °*Nyctèrophilia mormoopsis*, n. sp.
- °*Nycterophilia parnelli* Wenzel
- °*Trichobius caecus* Edwards
- *Trichobius galei* Wenzel
- °*Trichobius johnsonae* Wenzel

Pteronotus parnellii
- °*Aspidoptera buscki* Coquillett

Nycterophilia coxata Ferris
°*Nycterophilia fairchildi* Wenzel
°*Nycterophilia natali* Wenzel
Nycterophilia parnelli Wenzel
°*Paradyschiria lincata* Kessel
Trichobius caecus Edwards
°*Trichobius joblingi* Wenzel
Trichobius parasparsus, n. sp.
Trichobius sparsus Kessel
°*Trichobius sphaeronotus* Jobling

Pteronotus personatus
Trichobius johnsonae Wenzel

Pteronotus suapurensis
°*Nycterophilia coxata* Ferris
Nycterophilia fairchildi Wenzel
Trichobius bilobus, n. sp.
Trichobius johnsonae Wenzel

Family *Phyllostomidae*

Subfamily *Carolliinae*

Carollia brevicauda
Speiseria peytoni, n. sp.
°*Strebla alvarezi* Wenzel
Strebla curvata, n. sp.
Strebla guajiro (Garcia & Casal)
°*Trichobius dugesii* Townsend
Trichobius joblingi Wenzel
°*Trichobius parasiticus* Gervais
Trichobius persimilis, n. sp.

Carollia castanea
Trichobius joblingi Wenzel
Trichobius persimilis, n. sp.

Carollia perspicillata
°*Anastrebla modestini* Wenzel
°*Aspidoptera falcata*, n. sp.
°*Mastoptera* sp., *minuta* complex
°*Megistopoda aranea* (Coquillett)
°*Megistopoda* sp., *proxima* complex
Paracuctenodes similis, n. sp.
°*Paratrichobius* (?) *longicrus* Ribeiro
Speiseria ambigua Kessel
°*Strebla christinae* Wenzel
°*Strebla curvata*, n. sp.
Strebla guajiro (Garcia & Casal)
°*Strebla hertigi* Wenzel
°*Strebla matsoni*, n. sp.
°*Strebla mirabilis* (Waterhouse)
°*Strebla wiedemanni* Kolenati
°*Trichobioides perspicillatus* (Pessôa & Galvão)
°*Trichobius caecus* Edwards
Trichobius costalimai Guimarães
Trichobius joblingi Wenzel
°*Trichobius keenani* Wenzel
°*Trichobius lionycteridis* Wenzel
°*Trichobius parasiticus* Gervais
°*Trichobius parasparsus*, n. sp.
°*Trichobius tiptoni*, n. sp.
°*Trichobius uniformis* Curran

Carollia sp.
Speiseria ambigua Kessel
Strebla guajiro (Garcia & Casal)
°*Trichobioides perspicillatus* (Pessôa & Galvão)
°*Trichobius costalimai* Guimarães
Trichobius dugesioides Wenzel
Trichobius joblingi Wenzel

Rhinophylla pumilio
Neotrichobius sp., *delicatus* complex
°*Trichobius joblingi* Wenzel

Subfamily *Desmodontinae*

Desmodus rotundus
°*Mastoptera* sp., *minuta* complex
°*Megistopoda aranea* Coquillett
°*Paradyschiria curvata*, n. sp.
°*Paratrichobius dunni* (Curran)
°*Paratrichobius* sp., *longicrus* complex
°*Strebla consocius* Wenzel
°*Strebla guajiro* (Garcia & Casal)
Strebla wiedemanni Kolenati
°*Trichobius caecus* Edwards
°*Trichobius costalimai* Guimarães
°*Trichobius dugesioides* Wenzel
°*Trichobius joblingi* Wenzel
°*Trichobius longipes* (Rudow)
Trichobius parasiticus Gervais
°*Trichobius tiptoni*, n. sp.

Desmodus youngi
Strebla diaemi Wenzel
Trichobius diaemi, n. sp.
Trichobius parasiticus Gervais

Diphylla ecaudata
Trichobius diphyllae Wenzel

Subfamily *Glossophaginae*

Anoura caudifer
Anastrebla caudiferae, n. sp.
°*Aspidoptera buscki* Coquillett
Exastinion clovisi (Pessôa & Guimarães)
Trichobius tiptoni, n. sp.

Anoura cultrata
Anastrebla mattadeni Wenzel
Exastinion oculatum, n. sp.

Anoura geoffroyi
Anastrebla modestini Wenzel
Exastinion clovisi (Pessôa & Guimarães)
Strebla harderi, n. sp.
°*Strebla paramirabilis*, n. sp.
°*Trichobius caecus* Edwards
°*Trichobius costalimai* Guimarães
°*Trichobius joblingi* Wenzel
Trichobius propinquus, n. sp.
°*Trichobius uniformis* Curran

Anoura sp. A
Anastrebla modestini Wenzel
Exastinion clovisi (Pessôa & Guimarães)
°*Mastoptera* sp., *minuta* complex
Strebla harderi, n. sp.
Trichobius imitator, n. sp.
Trichobius propinquus, n. sp.

Glossophaga longirostris
°*Megistopoda aranea* (Coquillett)
°*Nycterophilia coxata* Ferris
Paracuctenodes longipes (Pessôa & Guimarães)
Strebla curvata, n. sp.
°*Strebla wiedemanni* Kolenati
°*Trichobioides perspicillatus* (Pessôa & Galvão)
Trichobius dugesii Townsend
°*Trichobius parasiticus* Gervais
°*Trichobius sphaeronotus* Jobling
°*Trichobius uniformis* Curran

Glossophaga soricina
°*Aspidoptera buscki* Coquillett
Paracuctenodes longipes (Pessôa & Guimarães)
°*Paratrichobius* sp., *longicrus* complex
°*Strebla alvarezi* Wenzel
Strebla curvata, n. sp.
Strebla guajiro (Garcia & Casal)
°*Strebla wiedemanni* Kolenati

Trichobius dugesii Townsend
°*Trichobius parasiticus* Gervais
Trichobius propinquus, n. sp.
Trichobius uniformis Curran

Leptonycteris curasoae
Megistopoda sp., *proxima* complex
Nycterophilia coxata Ferris
Nycterophilia fairchildi Wenzel
°*Trichobius caecus* Edwards
°*Trichobius galei* Wenzel
°*Trichobius parasiticus* Gervais
Trichobius sphaeronotus Jobling

Lionycteris spurrelli
Anastrebla spurrelli, n. sp.
Trichobius lionycteridis Wenzel

Lonchophylla robusta
Anastrebla nycteridis Wenzel
°*Anatrichobius scorzai* Wenzel
Phalcophila puliciformis, n. g., n. sp.
Trichobius lonchophyllae Wenzel

Lonchophylla thomasi
°*Strebla alvarezi* Wenzel

Subfamily *Phyllostominae*

Chrotopterus auritus
Strebla chrotopteri, n. sp.
°*Strebla mirabilis* (Waterhouse)
Trichobius dugesioides Wenzel

Lonchorhina aurita
°*Megistopoda aranea* (Coquillett)
°*Megistopoda* sp.
°*Nycterophilia parnelli* Wenzel
°*Speiseria ambigua* Kessel
Strebla altmani Wenzel
Trichobius flagellatus, n. sp.
°*Trichobius parasiticus* Gervais

Lonchorhina orinocensis
°*Nycterophilia parnelli* Wenzel
Strebla altmani Wenzel
Trichobius ethophallus, n. sp.
Trichobius flagellatus, n. sp.
°*Trichobius parasiticus* Gervais

Macrophyllum macrophyllum
°*Strebla altmani* Wenzel
Strebla matsoni, n. sp.
°*Trichobius caecus* Edwards
°*Trichobius dugesioides* Wenzel
°*Trichobius joblingi* Wenzel
Trichobius macrophylli Wenzel

Mieronycteris brachyotis
Trichobius tuttlei, n. sp.

Micronycteris megalotis
°*Speiseria ambigua* Kessel
Strebla alvarezi Wenzel
Trichobius keenani Wenzel
Trichobius sp.

Micronycteris microtis
Strebla alvarezi Wenzel
Trichobius keenani Wenzel

Micronycteris minuta
Strebla machadoi Wenzel
Trichobius handleyi, n. sp.
°*Trichobius joblingi* Wenzel

Micronycteris nicefori
Strebla obtusa, n. sp.
°*Trichobius dugesii* Wenzel
°*Trichobius joblingi* Wenzel

Micronycteris schmidtorum
Strebla machadoi Wenzel

Mimon crenulatum
°*Trichobius parasiticus* Gervais

Phylloderma stenops
°*Megistopoda aranea* (Coquillett)
°*Megistopoda* sp., *proxima* complex
°*Speiseria ambigua* Kessel
Strebla christinae Wenzel

Phyllostomus discolor
°*Mastoptera guimaraesi* Wenzel
°*Metelasmus pseudopterus* Coquillett
°*Strebla chrotopteri*, n. sp.
°*Strebla consocius* Wenzel
Strebla hertigi Wenzel
°*Strebla wiedemanni* Kolenati
Trichobioides perspicillatus (Pessôa & Galvão)
Trichobius costalimai Guimarães
°*Trichobius dugesioides* Wenzel
°*Trichobius persimilis*, n. sp.

Phyllostomus elongatus
Mastoptera sp., *minuta* complex
°*Nycterophilia coxata* Ferris
Strebla consocius Wenzel
°*Strebla guajiro* (Garcia & Casal)
Strebla mirabilis (Waterhouse)
°*Strebla obtusa*, n. sp.
Trichobius dugesioides Wenzel
°*Trichobius handleyi*, n. sp.
Trichobius joblingi Wenzel
Trichobius longipes (Rudow)
°*Trichobius persimilis*, n. sp.
Trichobius sp.

Phyllostomus hastatus
°*Aspidoptera buscki* Coquillett
°*Aspidoptera falcata*, n. sp.
Mastoptera guimaraesi Wenzel
Mastoptera sp., *minuta* complex
°*Megistopoda aranea* (Coquillett)
°*Megistopoda* sp., *proxima* complex
°*Metelasmus pseudopterus* Coquillett
°*Paratrichobius* sp., *salvini* complex
Strebla consocius Wenzel
°*Strebla guajiro* (Garcia & Casal)
Strebla hertigi Wenzel
Strebla mirabilis (Waterhouse)
°*Trichobius costalimai* Guimarães
°*Trichobius dugesioides* Wenzel
°*Trichobius joblingi* Wenzel
Trichobius longipes (Rudow)
°*Trichobius silvicolae*, n. sp.

Tonatia bidens
Mastoptera sp., *minuta* complex
Strebla galindoi Wenzel
Strebla kohlsi Wenzel

Tonatia brasiliensis
Mastoptera sp., *minuta* complex
Pseudostrebla greenwelli Wenzel
Strebla tonatiae Wenzel
Trichobius affinis, n. sp.

Tonatia carrikeri
Mastoptera sp., *minuta* complex
Pseudostrebla sparsisctis, n. sp.
Stizostrebla longirostris Jobling

Strebla tonatiae Wenzel
Trichobius sp.
Tonatia silvicola
Mastoptera minuta (Lima)
Pseudostrebla ribeiroi Lima
°*Strebla guajiro* (Garcia & Casal)
Strebla kohlsi Wenzel
°*Trichobius dugesioides* Wenzel
Trichobius silvicolae, n. sp.
Trachops cirrhosus
°*Paradyschiria curvata*, n. sp.
Speiseria magniocculus, n. sp.
°*Strebla consocius* Wenzel
Strebla mirabilis (Waterhouse)
°*Trichobius caecus* Edwards
Trichobius dugesioides Wenzel
Trichobius joblingi Wenzel

Subfamily *Stenodermatinae*
Ametrida centurio
°*Anastrebla spurrelli*, n. sp.
Artibeus cinereus
°*Aspidoptera falcata*, n. sp.
Paratrichobius lowei Wenzel
Artibeus fuliginosus
Aspidoptera buscki Coquillett
°*Mastoptera* sp.. *minuta* complex
Megistopoda aranea (Coquillett)
°*Megistopoda* sp.
Neotrichobius bisetosus, n. sp.
°*Strebla guajiro* (Garcia & Casal)
°*Strebla wiedemanni* Kolenati
°*Trichobius caecus* Edwards
°*Trichobius joblingi* Wenzel
Artibeus hartii
Paratrichobius sanchezi Wenzel
Artibeus jamaicensis
Aspidoptera buscki Coquillett
°*Aspidoptera falcata*, n. sp.
°*Exastinion clovisi* (Pessôa & Guimarães)
°*Mastoptera* sp., *minuta* complex
Megistopoda aranea (Coqnillett)
°*Megistopoda* sp., *proxima* complex
Metelasmus pseudopterus Coquillett
°*Neotrichobius bisetosus*, n. sp.
°*Neotrichobius* sp., *delicatus* complex
°*Nycterophilia coxata* Ferris
°*Strebla guajiro* (Garcia & Casal)
°*Strebla mirabilis* (Waterhouse)
Strebla paramirabilis, n. sp.
°*Strebla wiedemanni* Kolenati
°*Trichobioides perspicillatus* (Pessôa & Galvão)
Trichobius assimilis, n. sp.
°*Trichobius caecus* Edwards
°*Trichobius costalimai* Guimarães
°*Trichobius joblingi* Wenzel
°*Trichobius longipes* (Rudow)
°*Trichobius parasiticus* Gervais
Artibeus lituratus
Aspidoptera buscki Coquillett
°*Mastoptera* sp., *minuta* complex
°*Megistopoda aranea* (Coquillett)
°*Metelasmus pseudopterus* Coquillett
°*Strebla mirabilis* (Waterhouse)
°*Strebla wiedemanni* Kolenati
°*Trichobius caecus* Edwards
°*Trichobius joblingi* Wenzel
°*Trichobius parasiticus* Gervais
°*Trichobius uniformis* Curran
°*Trichobius urodermae* Wenzel
Artibeus sp. A
°*Metelasmus pseudopterus* (Coquillett)
Neotrichobius sp., *delicatus* complex
Artibeus sp. D
Strebla paramirabilis, n. sp.
Trichobius assimilis, n. sp.
Chiroderma salvini
Paratrichobius salvini Wenzel
°*Trichobius persimilis*, n. sp.
Chiroderma trinitatum
Paratrichobius sp., *salvini* complex
Chiroderma villosum
°*Metelasmus pseudopterus* (Coquillett)
°*Nycterophilia coxata* Ferris
Paratrichobius sp., *salvini* complex
°*Strebla chrotopteri*, n. sp.
°*Strebla wiedemanni* Kolenati
°*Trichobius dugesioides* Wenzel
°*Trichobius parasiticus* Gervais
Ectophylla macconnelli
Neotrichobius ectophyllae, n. sp.
Uroderma bilobatum
°*Aspidoptera buscki* Coquillett
°*Aspidoptera falcata*, n. sp.
°*Neotrichobius* sp., *delicatus* complex
Paratrichobius dunni (Curran)
°*Trichobius caecus* Edwards
°*Trichobius longipes* (Rudow)
°*Trichobius joblingi* Wenzel
Trichobius parasiticus Gervais
°*Trichobius parasparsus*, n. sp.
Trichobius urodermae Wenzel
Uroderma magnirostrum
°*Metelasmus pseudopterus* (Coquillett)
°*Neotrichobius* sp., *delicatus* complex
Paratrichobius dunni (Curran)
°*Strebla christinae* Wenzel
°*Strebla wiedemanni* Wenzel
°*Trichobius parasiticus* Gervais
Vampyressa bidens
Paratrichobius sp., *salvini* complex
Vampyressa pusilla
Neotrichobius delicatus (Machado-Allison)
Vampyrodes caraccioli
Paratrichobius sp., *salvini* complex
Vampyrops aurarius
Paratrichobius sp., *longicrus* complex
Strebla paramirabilis, n. sp.
Trichobius angulatus, n. sp.
°*Trichobius assimilis*, n. sp.
Vampyrops brachycephalus
Paratrichobius sp., *salvini* complex
Vampyrops helleri
°*Mastoptera* sp., *minuta* complex
°*Megistopoda* sp.
°*Neotrichobius* sp., *delicatus* complex
°*Nycterophilia fairchildi* Wenzel
Paratrichobius sp. (? *salvini* Wenzel)
°*Strebla consocius* Wenzel
°*Trichobius dugesii* Townsend
°*Trichobius lionycteridis* Wenzel
°*Trichobius tiptoni*, n. sp.
°*Trichobius uniformis* Curran
Vampyrops umbratus
°*Aspidoptera falcata*, n. sp.
°*Megistopoda* sp.
Paratrichobius sp., *longicrus* complex
°*Strebla wiedemanni* Kolenati
°*Trichobius parasiticus* Gervais

°*Trichobius persimilis*, n. sp.
Trichobius vampyropis Wenzel
Vampyrops vittatus
Paratrichobius sp. (? *longicrus* Ribeiro)
Trichobius vampyropis
Sphaeronycteris toxophyllum
°*Aspidoptera falcata*, n. sp.
°*Trichobius costalimai* Guimarães
°*Trichobius dugesioides* Wenzel

Subfamily *Sturnirinae*
Sturnira bidens
Trichobius hispidus, n. sp.
Sturnira bogotensis
Trichobius petersoni, n. sp.
Sturnira erythromos
Megistopoda sp., *proxima* complex
°*Trichobius joblingi* Wenzel
Trichobius petersoni, n. sp.
Sturnira lilium
Aspidoptera delatorrei Wenzel
Aspidoptera falcata, n. sp.
°*Mastoptera* sp., *minuta* complex
°*Megistopoda aranea* (Coquillett)
Megistopoda sp., *proxima* complex
°*Speiseria ambigua* Kessel
°*Strebla galindoi* Wenzel
°*Strebla guajiro* (Garcia & Casal)
°*Strebla hertigi* Wenzel
°*Strebla tonatiae* Wenzel
°*Strebla wiedemanni* Kolenati
°*Trichobioides perspicillatus* (Pessôa & Galvão)
°*Trichobius costalimai* Guimarães
°*Trichobius dugesioides* Wenzel
°*Trichobius joblingi* Wenzel
°*Trichobius lionycteridis* Wenzel
°*Trichobius lonchophyllae* Wenzel
°*Trichobius parasiticus* Gervais
°*Trichobius parasparsus*, n. sp.
Sturnira ludovici
Aspidoptera falcata, n. sp.
°*Megistopoda aranea* (Coquillett)
Megistopoda sp., *proxima* complex
Metelasmus sp.
°*Trichobius costalimai* Guimarães
°*Trichobius persimilis*, n. sp.
Sturnira tildae
Aspidoptera falcata, n. sp.
Megistopoda sp., *proxima* complex
°*Nycterophilia parnelli* Wenzel
°*Strebla guajiro* (Garcia & Casal)
°*Trichobius joblingi* Wenzel
°*Trichobius parasparsus*, n. sp.
Sturnira sp.
Trichobius hispidus, n. sp.

Superfamily *Vespertilionoidea*
Family *Furipteridae*
Furipterus horrens
Trichobius pallidus (Curran)

Family *Molossidae*
Eumops glaucinus
°*Nycterophilia coxata* Ferris
°*Strebla christinae* Wenzel
°*Trichobioides perspicillatus* (Pessôa & Galvão)
Molossus ater
°*Noctiliostrebla maai* Wenzel
°*Paradyschiria curvata*, n. sp.
°*Paradyschiria parvula* Wenzel
Trichobius jubatus, n. sp.
°*Trichobius longipes* (Rudow)
Molossus aztecus
°*Paradyschiria parvula* Wenzel
Trichobius jubatus, n. sp.
°*Trichobius lionycteridis* Wenzel
Tadarida gracilis
°*Paracuctenodes longipes* Pessôa & Guimarães

Family *Natalidae*
Natalus tumidirostris
°*Nycterophilia coxata* Ferris
°*Nycterophilia fairchildi* Wenzel
Nycterophilia natali Wenzel
Trichobius galei Wenzel
°*Trichobius sparsus* Kessel

Family *Vespertilionidae*
Myotis keaysi
Anatrichobius scorzai Wenzel
°*Trichobius caecus* Edwards
Myotis larensis
°*Trichobius costalimai* Guimarães
Myotis nigricans
°*Metelasmus pseudopterus* (Coquillett)
°*Trichobius parasiticus* Gervais
Myotis oxyotus
Anatrichobius scorzai Wenzel
Rhogeessa minutilla
°*Trichobius sphaeronotus* Jobling

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